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LEEDS: 70, Albion Street . . *Leeds 27174*
BRISTOL: 20, Victoria Square, Clifton *Bristol 33873*
Annually £5 by post Single copies, Two shillings.
Registered at the G.P.O. as a newspaper. Entered as second-class matter in U.S.A.

Editor: B. W. C. Cooke, Assoc. Inst. T.

Vol. 110] FRIDAY, MAY 29, 1959 [No. 22

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Re-nationalisation of Road Haulage

ROAD hauliers were urged by Viscount Hailsham, Chairman of the Conservative Party Organisation, principal guest at the Road Haulage Association annual dinner at Grosvenor House, W.1, last week, stoutly to oppose the intended re-nationalisation of their industry by the Labour Party if returned to power. In stressing the advantages of private, and decrying the supposed evils of State, ownership in road transport, Lord Hailsham was less than fair to the State-owned undertaking immediately before it was disrupted through partial de-nationalisation as a result of the Conservative Government Transport Act of 1953. Much progress was made in increasing efficiency. By the middle of 1953, a great many users, including not a few who had disliked the idea of a State-owned road transport organisation, were praising the service given by British Road Services. Net traffic receipts for 1951 were £3.2 million; for 1953, a year of considerable uncertainty, when the undertaking functioned under the shadow of impending disruption, they were £8.9 million. Nor had full advantage been taken, as it should have been, since nationalisation in 1948 of the powers accorded to the British Transport Commission under the Act of 1947, to co-ordinate goods services by rail and road. Had this been done, the Conservative Government in 1952 would have had the problem of de-nationalising a road haulage organisation much more closely integrated with that of the railways, with corresponding difficulties in selling off its assets. Even so, the partial de-nationalisation which took place was probably the most retrograde step taken by any Government in this country as regards transport. It destroyed much of the effectiveness of the State-owned undertaking by which users and the State, as owner, were beginning to profit; it added greatly to the disturbance already caused in public transport by the reorganisation of the railways under the 1953 Act; and it can be regarded only as a major blow to the efficiency of nationalised transport by those who realise the importance of profiting by the opportunities for co-ordinating the various forms of carriage, more particularly by railway and road, afforded by public ownership.

Contractors Aid in B.T.C. Works

IN many of the major works which are now beginning to come to fruition under the railways modernisation plan, the help of outside contractors has played a very valuable part. The provision of cables, signalling equipment, rolling stock of all kinds and suchlike work has been customary for many years, but it is inherent in many of the major works that civil engineering should be a basic factor in the schemes. Several prominent civil engineering contractors have done much to help forward the British Transport Commission's plans. Sir Brian Robertson, Chairman of the Commission, has been generous in his acknowledgement of the assistance which they have rendered and of the excellent work they have performed. When speaking on this matter in public last week, he said it was good to see them put their goods in the shop window and that he hoped that the display which they made would lead to orders for the British civil engineering industry from many parts of the world. The employment of outside contractors has many advantages from the railway point of view, and the backing they receive from the B.T.C. equally is of great value to the contractors.

Eastern Region Modernisation Works

THE tunnels and new lines on the New Barnet to Potters Bar section of the Eastern Region were opened on May 20, with becoming ceremony, by Sir Brian Robertson, Chairman of the British Transport Commission. These works are an important section of the overall modernisation plan of British Railways, and have been described in some detail in previous issues. The need for extra running lines on this section has been apparent since the first world war, and both these works, and also the Temple Mills Marshalling Yard, described in our May 15 issue, were among the projects sanctioned by the Railway Executive in the early days of nationalisation. It was appropriate that among the guests at the recent ceremonies were Sir John Elliot, Chairman of the Railway Executive at that time, and Sir J. Landale Train and Sir Michael Barrington-Ward, who were not only members of the R.E. but had also served with the L.N.E.R. Many of those at the celebrations remembered, too, the late Mr. C. K. Bird, who, as General Manager, had argued so strongly in favour of these improvements. The culmination of these long laid projects is evidence of the continuing process of improvement in British railway engineering over the years, which proceeds notwithstanding variations in organisational procedure.

Season Ticket Fares

RECENT suggestions that season ticket holders travelling at peak periods might be subject to a surcharge in an endeavour to induce them to stagger their hours of travel have been refuted by Sir Brian Robertson, Chairman of the British Transport Commission. He takes the view that those who travel in the greatest discomfort should not be asked, "at any rate for the present time," to make an additional payment for the privilege. The British Transport Commission is considering dealing with the matter in some different way,

although, perhaps, the effect will not be so very dissimilar. To induce travel at off-peak periods it would prefer to make substantial concessions for travel outside the busiest times. This can hardly be expected to spread the load of the vast majority of peak-hour travellers but it may result in the spread of non-essential travel.

Permanent Way Institution Summer Convention

THE seventy-fifth anniversary of the Permanent Way Institution is being celebrated on June 6-11 by the holding of the 1959 Summer Convention in London. The venue is appropriate, for membership of the London Section of the Institute, which will act as host, includes those who lay and maintain the track of the railway network in and around the capital. The President of the Institution is Mr. C. E. Dunton, Chief Civil Engineer, London Transport Executive. Sir John Elliot, Chairman, and the Members of L.T.E. will receive members of the Institution on June 6. The thanksgiving service next day will be conducted in St. Pancras Church, Euston Road, which has close railway associations. The celebrations will also include a reception on June 9, attended by the Lord Mayor of London, and, later that day, the annual Summer Dinner at which the principal guest will be Sir Brian Robertson, Chairman of the British Transport Commission. Among the installations and engineering work in progress to be visited are the Kent Coast electrification of the Southern Region; the Signalling Department of Henry Williams Limited at Rickmansworth; electrification and associated works between London and Clacton, Eastern Region; L.T.E. night-maintained railways; and the L.T.E. Lillie Bridge Depot.

Appointments Service for Professional Engineers

THE transfer of the functions of the Professional Engineers Appointments Bureau to the Engineers' Guild with effect, it is hoped, from June 1, should go far to increase the efficiency of the engineering industry, helping both engineers and the firms which use their services. Some particulars of the new arrangements are given on another page. An appointments division is to be created in the Guild office to carry out the functions newly transferred. The work of the division will be controlled by a Professional Engineers Appointments Board, appointed by, and responsible to, the Guild. The Professional Engineers Appointments Bureau, formed in 1945 with the support of industry and the engineering institutions, has established itself as a principal channel for filling appointments. It also performs much useful work in producing and maintaining statistics of remuneration and conditions of service. Co-ordination of this with the work of the Engineers' Guild will enhance the service given to engineers and their employers. In undertaking this additional responsibility, the Council of the Guild rightly believes that it will be promoting the public usefulness, and interests of the engineering profession. The services of the appointments division will be available to members of the profession whether or not they are members of the Guild, and there is no intention of increasing the current scales of fee.

Diesel Working on the C.P.R.

The President of the Canadian Pacific Railway Company, Mr. N. R. Crump, pointed out recently that over 90 per cent of C.P.R. rail services are now being run by diesel power. As a result, it is estimated that the £70,000,000 outlay on this form of transport is effecting an annual saving exceeding £14,000,000 and a reduction in maintenance costs of over £3,000,000. The standard of efficiency secured is also striking. The average freight train load has been increased by 500 gross tons or 31 per cent since 1947 when dieselisation was just getting under way; a corresponding increase in speed has been by 26 per cent. Moreover, there has been an improvement of no less than 65 per cent in gross ton-miles per freight-train-hour in the same period. The savings for which diesel traction has been responsible on this railway are therefore great, and yet they have not proved sufficient to balance inflated post-war wage and material costs. It is also noteworthy that the £4,000,000 outlay upon diesel railcars has greatly improved economy and service in passenger workings.

Popularity of " Car/Sleeper " Services

THE congestion at Whitsuntide on the roads of Britain and France and other Western European countries is likely to increase the popularity of the " car/sleeper " services. These afford motorists comfortable overnight rail journeys, accompanied by their cars, to and from the district in which they tour for pleasure, or, in the case of Anglo-Continental traffic, between the home district and a Channel port in Britain or between a port and a railhead such as Lyons, serving an attractive area for touring. The number of services is increasing. The French National Railways, for instance, are introducing, next month, a " car/sleeper " three nights a week each way between Paris and Avignon, some 450 miles. That is an optimum distance, as the motorist is saved much tedious driving, the overnight rail journeys are conveniently short, and railway receipts are commensurate with the mileage. Crowding of the roads around large cities probably will cause demands for more services over shorter distances. A feature of this traffic is that trains can be worked as shuttles with maximum use of passenger stock and motorcar wagons and vans. Well-organised loading and unloading at terminals keeps operating costs low.

Glasgow to Clyde Coast Diesel Services

THE first 50-min. runs between Glasgow St. Enoch and Ayr were in 1905, when the Glasgow & South Western Railway inaugurated a pair of non-stop trains. Introduction by British Railways, Scottish Region, of " inter-city " type diesel trains next autumn makes possible a 50-min. run from St. Enoch to Ayr with stops at Troon and Prestwick. The Glasgow-Ayr diesel service will consist of 28 trains each way, replacing the present 20 steam trains. Besides more trains at peak hours, there will be two trains every hour for much of the day. A start on conversion to diesel traction of the Glasgow-Largs route is to be made by using six diesel trains on Mondays to Fridays and four on Saturdays. The " Irishman," running between St. Enoch and Stranraer Harbour in connection with the Stranraer-Larne steamers, will be worked by diesel sets, as will one other Glasgow-Stranraer service. Some details of what is planned are given elsewhere in this issue. These lines of the former G.S.W.R., because of the large number of important places served, necessitating intensive services with fairly frequent stops, are very suitable for diesel operation. They will be worked by six-car trains at busy periods and three-car trains in off-peak hours.

Research in Rubber Suspension

THE greatly extended use of rubber as a means of damping vibration during the past 20 years has been aided to a large extent by bonding rubber to the metal components. By this means the problem of locating and securing the rubber in a dynamic structure has been overcome. Many other problems associated with rubber composition and mechanical design had to be solved before the confidence of engineers could be established in the part which rubber now plays as a stress-carrying material. Much of the experience gained in this field by Metalastik Limited has been applied in recent years to the use of rubber additionally as a springing medium for both rail and road vehicles for public transport. Elsewhere in this issue we describe some of the equipment used in research and development work now carried on by the company in its new research building at Leicester. It seems likely that bonded rubber will have more uses in engineering. Opportunities for its application probably will arise through increasing use of new constructional materials and techniques, more powerful prime movers and higher reciprocating speeds, the need for greater efficiency with less maintenance, and growing awareness that vibration and noise are unnecessary discomforts.

Bridging Activity in New Zealand

MAJOR works in progress on the New Zealand Government Railways include a 26-span bridge over the Selwyn River, 22 miles south of Christchurch. It will replace the present 60-year-old timber structure and is expected to be complete about the end of this year. Each of the 26 steel

plate-girder spans will be 40 ft. long. The piers are to be reinforced 30-ft.-long concrete piles with reinforced concrete caps. This probably will be the first use of 24-in. dia. octagonal piles for a railway bridge in New Zealand; the standard dia. was 16 in. In the North Island, the bridge over the Wanganui River at Aramoho, on the Marton-New Plymouth line, is to be replaced within two years. Work has begun at the Hutt railway workshops on fabrication of the steel trusses that will span the river in five 120-ft. lengths. They will be carried on the existing concrete piers and will replace the present heavy wooden spans. A 396-ft. steel girder bridge on concrete piers was recently completed at Topuni, 78 miles north of Auckland. The timber truss spans of two 78-year-old timber bridges on the Wairarapa line are being replaced by prefabricated steel spans imported from Britain.

Canadian National to Engage in Road Transport

THE President of the Canadian National Railways, Mr. Donald Gordon, stated recently before the Canadian House of Commons Railway Committee that the C.N.R. was to expand its road transport operations substantially. Co-ordination was envisaged of railway and road services. A loan is stated to be sought from the Federal Government of $15,000,000. This is believed to be largely for investment in road haulage, in a subsidiary called Canadian National Transportation Limited, of which the issued capital up to now has been only $500. Mr. Gordon, who was unable to give further details of what was planned, pointed out that some traffic now conveyed by rail would be better moved by road. The cost of the extensive terminal facilities provided for railway traffic was an important factor in determining policy. Less-than-wagonload traffic, he added, might be handled more expeditiously by road services. Meanwhile, the C.N.R. has been extending its piggyback services, using railway-owned trailers, including refrigerated trailers for perishables.

French-built A.C. Electric Locomotives for U.S.S.R.

THE U.S.S.R. Railways, which are electrifying considerable mileages at 50 cycles, are taking advantage of the experience gained by French industry in constructing a.c. locomotives for the French National Railways. They recently placed with M.T.E. and Alsthom an order for 50, 50-cycle single-phase locomotives, namely, 10 main-line and 30 goods locomotives with maximum speeds respectively of 100 and 62 m.p.h., and 10 other goods locomotives of the same type equipped with ignitron regenerative braking. The first goods traffic locomotive is now completed and under-load tests are being carried out on the S.N.C.F. In view of the difference between the French standard and U.S.S.R. 5-ft. gauges the bogies have been adapted for test purposes to take standard-gauge wheels, whilst the Russian automatic centre buffer coupling has been temporarily changed for the U.I.C. standard coupling. It is for speculation whether this order will be followed by others from French builders, or whether the Russians will then consider themselves advanced enough in techniques to build their own a.c. motive power.

London Midland Region Summer Timetables

THE most welcome feature of the summer timetables of the London Midland Region is the general reduction in the recovery times which were added to all Western Division main line schedules in September last, to allow for speed restrictions in connection with the electrification work. There is as yet no information as to whether this reduction applies to the summer service only, with a reversion to the present times with the next winter service, but the present effect is to bring many journey times back to within 4 or 5 min. of what they were before the deceleration took place. The 10 min. earlier departures of all long-distance trains from Euston, however, still remain.

Mile-a-minute schedules disappeared completely from the winter timetables, but now several are reintroduced; the 7.45 a.m. " Lancastrian " from Euston to Manchester and Liverpool, for example, is scheduled to cover the 140.6 miles from Watford to Crewe in 140 min.; the 12.40, 2.10 and 5.40 p.m. from Euston, the 94.0 miles to Coventry in 94 min.; and the 2.25 p.m. from Birmingham the 82.6 miles from Rugby to Euston in 78 min. (63.5 m.p.h., the fastest present L.M.R. booking). In these days when mile-a-minute runs are regarded as an advertising point, it is a pity that such runs as those of the " Caledonian " between Euston and Carlisle in each direction, 299.1 miles in 300 min., should fall short of this standard by no more than a single minute, and similarly the 8.50 and 9.1 a.m. from Crewe to Euston, 158.0 miles in 159 min.

With these improvements the fastest time between Euston and Birmingham is reduced from 2 hr. 7 min. down to 2 hr. 3 min. (the 12.40 and 2.10 p.m. from Euston), and up from 2 hr. 9 min. to 2 hr. 1 min. (the 12.30 and 4.30 p.m. from Birmingham) ; the biggest single acceleration is that of 10 min. in the case of the 4.30 p.m. up, now to be due in Euston at 6.31 instead of 6.41 p.m. An unfortunate defect in the L.M.R. London-Birmingham-Wolverhampton service is the complete absence of refreshment facilities on such trains as the 2.20 and 6.55 p.m. from Euston to Birmingham and the 10.10 a.m., 2.25 and 5 p.m. from Birmingham to Euston, among the most important trains in the country that are thus unprovided.

The 10.20 a.m. down " Manxman," now non-stop from Euston to Liverpool, is to call at Crewe at 1.16 p.m. A new summer relief train is advertised on Fridays at 2.28 p.m. from Euston to Stockport and Manchester only, arriving at 6.34 p.m., 16 min. ahead of the 2.35 p.m. By the accelerations, the 8.10 a.m. from Manchester will reach Euston at 12.45 p.m., 3 min. earlier than last summer before the decelerations; the 10.0 a.m., 12 noon, 4.0 p.m. " Lancastrian " and 5.45 p.m. " Comet " (the last-named no longer stopping at Crewe) will arrive at their pre-deceleration times, and most of the remaining Manchester trains from 2 to 5 min. later. In the down direction the 9.35 a.m. " Comet " will be 3 min. slower to Manchester, and the 7.45 a.m. " Lancastrian," 5.50 p.m. " Mancunian," and 4.20 p.m. 4 min. slower. Between Euston and Manchester the fastest times will now be 3 hr. 38 min. down (the 9.35 a.m. " Comet ") and 3 hr. 40 min. up (the 9.35 a.m. " Mancunian ") ; and to and from Liverpool 3 hr. 44 min. down (the 7.45 a.m.) and 3 hr. 40 min. up (the 5.15 p.m. " Red Rose ").

On the Midland Division there is little of change to report. On Sunday evenings there is to be a rearrangement of the service from St. Pancras to Nottingham and Derby. The 6.0 p.m. down will run to Derby instead of to Nottingham, omitting the Kettering stop, and calling only at Leicester, will reach Derby at 8.35 p.m., 37 min. ahead of the present 6.10 p.m. down. The 6.10 p.m. will run to Nottingham instead of Manchester, calling at Bedford, Kettering, Market Harborough and Leicester, and reaching Nottingham at 9.14 p.m. (22 min. slower than the present 6.0 p.m.). The restaurant car train to Manchester will leave St. Pancras at 6.35 p.m., and be non-stop to Leicester, so reaching Derby at 9.20 p.m., an acceleration of 17 min. on the present 6.10 p.m.

In the up direction the Sunday 3.52 p.m. from Bradford to St. Pancras will start 2 min. earlier, omit the Wellingborough, Bedford and Luton stops (which will be made by a 7.35 p.m. relief from Kettering), and be into St. Pancras at 9.40 p.m., 20 min. earlier. Throughout the week from 5 to 10 min. will be added to most schedules between Sheffield and Leeds, due to the imposition of more severe speed restrictions over the pitfall areas by the Eastern Region, which is now in control of most of this section of the former Midland main line.

The last sentence brings a reminder of the increasing difficulties for timetable users that are being caused by the recent changes in Regional boundaries. We cannot imagine what justification there can be for showing in this book the whole of the former Midland main line from St. Pancras to Carlisle in the London Midland Region with the exception of the Leeds-Skipton section, because the latter is now in North Eastern territory. Equally the cutting short of the former Midland main line from Birmingham to Bristol at Worcester is a source of irritation to those who would instinctively consult the L.M.R. book in regard to the whole length to Bath and Bristol of so characteristically Midland a piece of line. Conversely, one wonders at the necessity for including the former Great Northern Grantham-Nottingham line in the London Midland book, or the typically North Eastern Newcastle-Carlisle line.

Incidentally, the last-mentioned, reprinted from the North Eastern Region book, has the usual indication of all servic

normally worked by diesel multiple-units, as does also the Carlisle-Hawick-Edinburgh table from the Scottish Region book, yet no such indications appear in the London Midland tables proper. Surely a common form of indication of this most popular form of travel could be agreed, so that all the Regional books might conform in this respect. It may also be hoped that in due course the London Midland Region book will be printed throughout with type of the same size and clarity as those of all the other Regions; at present the scale of reduction of the former's principal tables makes them by no means easy to consult by those who have not the best of eyesight.

Strengthening the Assam Rail Link

THE NORTH-EAST Frontier Railway in India came into being nearly 18 months ago and inherited a momentous task in the strengthening of the Assam Link line. Constructed to connect lines in the Indian province of Assam with the rest of that country without entering East Pakistan territory, this railway had to hug the Himalayan foothills from Siliguri eastwards until the Brahmaputra River was approached. Consequently it traverses difficult terrain, cutting across the natural drainage of the country and often crossing rivers debouching from gorges. Moreover, there is a very high rainfall in this area, torrential rains causing sudden river-spates and dislodging massive boulders and uprooting trees, with the result that channels and bridges often become blocked and streams become diverted from their courses.

The new line was thus exposed to annual damage and interruption sometimes for considerable periods. In 1950 traffic was suspended for 57 days, in 1952 for 54 days, in 1954 for 110 days and in 1955 for 64 days. Heavy repair, reconstruction and diversion works were therefore undertaken and as a result there has been no major interruption to traffic during the past two or three years. To ensure continuity in all weathers, embankments have been and are being raised and regraded, bridges are being rebuilt with deeper foundations, increased waterways and longer spans, and guide banks, aprons and other protection works are being strengthened. The total cost is about £4,500,000 and the major works include 37 bridges, the replacement of five "dips" (Irish bridges) by viaducts, and at least one realignment to ease gradients and secure a single crossing of two rivers. Work at most places is being carried out in shifts round the clock, with the aid of portable generating sets for lighting at night.

The Daina River bridge previously consisted of 18 spans of 60 ft. and has been replaced by a new structure 70 ft. away having seven spans of 150 ft. and piers with well-foundations 45 ft. deep below low water level; the approaches have been protected with armoured guide banks. Due to boulders of 6 ft.-8 ft. dia. being encountered and broken up with blasting, and to smaller stones, the well-sinking was carried out with pneumatic caissons. Some 181,000 cu. ft. of concrete and 825 tons of steel have gone into these foundations, and in the guide banks about 8,000,000 cu. ft. of earthwork, 655,000 cu. ft. of cement concrete in protection blocks, 647,000 cu. ft. of boulders in wire crates, and 251,000 cu. ft. in ordinary pitching have been used.

Another bridge that has given continuous trouble is that over the Torsa River or rather the river and not the bridge itself has caused traffic interruption. The bridge consists of nine spans of 150 ft. with piers founded on wells 55 ft. deep, but the problem has been to keep the river flowing through it and to prevent it changing its course over a long distance. In 1950 it did so and flowed into the neighbouring river, the Hollong, the bridge over which was washed away; this recurred in 1952 and in 1954 the bridge and its approaches were seriously damaged. Among the protection works undertaken is a retired guide bank nearly five miles long, itself protected by groynes with armoured heads at suitable intervals; it is intended that there shall eventually be 24 of these groynes when the works are completed. Altogether, 13,000,000 cu. ft. earthwork, 650,000 cu. ft. of cement concrete in blocks, and 680,000 cu. ft. of stone pitching have been required at the Torsa alone.

Another source of considerable trouble has been the great quantities of silt and boulders brought down from the mountains by most of the streams causing them to silt up, overflow their banks and change their courses. Large numbers of additional flood openings have had to be provided and others originally built as "dips" have been replaced as mentioned above. One of the replacing viaducts consists of 28 spans of 10 ft. R.C. slabs. From these few notes, mentioning only some of the major works, it will be appreciated how extensive are the strengthening works involved. That they have become necessary is due mainly to the more or less obligatory route followed by the construction, much of it through the worst possible topography and also because political pressure enforced ultra-rapid constructional progress. It is remarkable that a line was carried through in the time, and considerable trouble in keeping it open subsequently was only to be expected.

Staggered Rail-joints

A PERMANENT WAY practice in which American railways differ from those in almost every part of the world is that of staggering rail-joints. In Great Britain the former Great Eastern Railway tried this on a limited scale, at a time when its American General Manager, the late Sir Henry Thornton, was in office, with Mr. John Miller, whom he had brought over with him, as his Chief Civil Engineer. The aim in part was economy, for with staggered joints it was regarded as justifiable to dispense with the timbers in place of sleepers and the heavier joint chairs which were being used on each side of G.E.R. rail-joints at that time. It was also hoped to promote smoother riding of rolling stock if the joints were not opposite one another.

It was soon found that if the surface of the track was not very well maintained by constant attention to packing at the joints, the alternate depressions at the joints on opposite sides of the track tended to set up a periodical swaying motion of the coaches at certain speeds. So the practice of staggered joints on the G.E.R. was not perpetuated, and in any event it would have been likely to fall into disuse with the introduction of mechanised relaying of the track in completely assembled panels.

Engineers responsible for track maintenance on U.S.A. railways seem to be almost unanimously in favour of staggering joints. It is admitted that with track so laid, a series of low or battered joints may cause wagons to rock, especially those with a high centre of gravity, and that in exceptional cases derailment might even result. Yet with the track in such a condition square joints also can cause very rough riding, and even greater wear and tear of track and equipment. The most important point, however, is that the rail is assumed to be a continuous beam. The joints in it, therefore, should be located at points which will provide as uniform and rigid a structure as possible. Moreover, it is held that gauging, lining, and surfacing the rail-joints are simplified when a depressed joint is located opposite the middle of the other rail of the track.

One engineer has been in charge of a good many miles of lightly-trafficked line laid with square joints deliberately so as to avoid side-to-side sway of rolling stock. To achieve this, good line and cross-level had been regarded as of greater importance than good surface. In this engineer's opinion the rail-ends have battered to a greater degree than if the line had been laid with staggered joints. The diesel locomotives tend to slip when passing over depressed joints on steep up gradients, to such an extent that loads sometimes have to be reduced. He has stated also that difficulties arise as the result of creep, the two rails of the track not always moving at the same rate nor always even in the same direction, with the result that more sleepers have skewed at the joints than would have been the case with square joints.

A maintenance engineer of one of the major railways, on the other hand, considers that with flat-bottom track, with rails of 127 lb. per yd. weight or more, staggered joints are no longer necessary, provided that reinforced fishplates are in use. In his opinion one of the advantages of square joints is that there are fewer joints in the vicinity of switch and crossing work. Another is that the track can be relaid with completely-assembled panels, as is the widespread practice in Great Britain. He also pointed out that with track welded *in situ* there is no advantage to be gained by having the rail-ends other than opposite one another.

It is significant that this particular officer, concerned with

the maintenance of track over which fast and heavy traffic is operated, should state quite categorically that track with the joints opposite one another can be relaid and maintained more economically than track with staggered joints. But with minor lines laid with rails of 105 lb. per yd. weight or less, and plain fishplates, he seems to favour the staggered arrangement of joints.

In this connection it is to be noted that the majority of the Great Eastern Railway track with staggered joints was in the Cambridge District, over routes not heavily trafficked, with 85-lb. and not the heavier 95-lb. rails.

South African Railways in 1957-58

THE report of the South African Railways & Harbours Administration for the year ended March 31, 1958, has been received from Mr. D. H. C. du Plessis, General Manager. It shows balances in the net revenue accounts of all services under the Administration as follow : Railways, £3,010,889 ; Harbours, £3,213,290 ; Steamships, £2,914 ; Airways, £647,435, a total from all sources of £6,874,529. Appropriations against this total were : £1,500,000 to the betterment fund ; £25,200 towards reducing the deficiency in the pension fund ; £1,000,000 special contribution to the renewals fund, leaving a surplus of £4,349,329.

The figures for the railways, including road transport and other ancillary services, are given in the table of principal results below :—

	1956-57	1957-58
	Thousands	*Thousands*
Passenger journeys	265,670	266,788
Goods tonnage	64,685	65,794
Passenger train-miles	22,075	22,346
Mixed train-miles	7,324	7,245
Goods train-miles	65,606	66,620
Total train-miles	95,005	96,211
Total freight ton-miles	17,441,649	18,191,642
	£ *thousands*	£ *thousands*
Passenger receipts	19,071	18,878
Parcel & mails receipts	4,606	4,866
Goods, coal & livestock receipts	107,637	114,327
Miscellaneous receipts	8,102	8,726
Total receipts	139,416	146,797
Working expenses	92,173	93,728
Depreciation	8,355	9,338
Total expenditure	100,529	103,066
Surplus	38,888	43,731
Interest and other charges (net)	38,079	40,720
Balance, railways	809	3,011

As compared with 1956-57, railway revenue increased under all heads except passengers and mails, and the ratio of expenditure to earnings fell slightly from 72.11 per cent in 1957 to 70.21, after having risen sharply from 62.63 in 1956.

The total tonnage of all classes of goods traffic during 1957-58 was 77,004,436, an increase of 1,972,812 or 2.63 per cent over the record figure for 1956-57. It was not found possible to maintain the increase of 3.7 per cent reflected in 1955-56 partly because during 1957 even the comparatively few additional track facilities which became available could not be utilised fully as the tractive force was still insufficient. The wagon turn-round time decreased from 9.03 to 8.65 days even though the average length of haul increased from 274 to 278 miles and freight ton-miles advanced by 4 per cent. A series of mishaps, some caused by exceptionally cold weather, snow storms, floods, and a damaged bridge, closed certain lines for protracted periods, immobilising a large number of wagons.

The total number of passengers carried increased by 1,118,528 Suburban passenger journeys increased by 2,155,662, but a decrease of 1,037,134 is recorded in respect of long-distance passengers which led to the fall of £192,496 in passenger receipts.

The route-mileage of line owned by the South African Government and open for traffic on March 31, 1958, totalled 13,435, a figure smaller by six miles than a year earlier because of route shortening by realignments.

During the year under review, 28 " Class 5E " electric and 39 steam locomotives " Class GMAM " were placed in service, but the net gain in steam locomotives owing to scrappings, was only 23. The total locomotive tractive force increased by 2,730,750 lb. to 105,761,868 lb. A further 33 steam, 335 electric and 211 diesel locomotives for which orders had been placed or approved, remained to be delivered at March 31, 1958.

A section of the report is devoted to diesel-electric traction and to the main considerations influencing the decision to use this type of locomotive, 45 of which were purchased in the U.S.A. with 1,320-h.p. Cooper-Bessemer engines, for service on the Western Transvaal System. Ultimately all services on the South West Africa System, including those of the narrow-gauge lines when broadened, will be operated by diesel-electric locomotives, starting with 115 1,980-h.p. units also powered by Cooper-Bessemer engines and with 1-Co-Co-1 wheel arrangement, the delivery of which will commence in October, 1959.

Among improved facilities mentioned are the Bayhead marshalling-yard at Durban and the Leeuhof yard at Vereeniging, both of which came into service during April, 1957. The final sections of throughout doubling from Danskraal to Cedara were brought into use during August and September, 1957, and three additional staging roads at Charlestown were completed in February, 1958, to ease the yard position at Volksrust. In addition, remotely-controlled loop-line connections between Warrenton and Belmont were completed.

Transport Administration in Tasmania

THE regulation of the public transport undertaking in a country of short distances and a highly-developed road system which result in severe road competition with the railways, is described in a paper by Mr. C. E. Baird, Commissioner for Transport, Tasmania, in a paper prepared for the Railway Sub-Committee of the Inland Transport Committee of the United Nations Economic Commission for Asia & the Far East (E.C.A.F.E.). Government-owned railway mileage is 575. The road milage is extensive. Tasmania is unique among Australian States in that the responsibility for administration of Government-owned railway, road, coastal shipping, ferry, and vehicular ferry services is vested in the Transport Commission. That body is responsible *inter alia* for the issue of public vehicle licences (including air services within the State), commercial road transport in competition with the State-owned railways, and control of State-owned railways. Such centralised administration is considered in Tasmania to have advantages where the transport undertakings are on a small scale. Apart from this, steep gradients occasioned by the mountainous terrain, make construction and maintenance of the 3-ft. 6-in. gauge railways expensive. The population, averaging 13 people to the square mile, is concentrated in three main areas: round Hobart, the capital, in the south; round Launceston in the north; and in the north-west coastal strip. Coastal shipping plays an important part. Although the economy of the State is mainly agricultural, there has been a considerable increase in secondary industrial production, including that of timber, newsprint, textiles, copper, and aluminium.

At the request of the State Government, Mr. M. S. Wilson, of the New South Wales Transport Department, some years ago conducted an inquiry into transport in Tasmania. In his report he stressed the impracticability of the duplication of transport in a small territory, but pointed out that the railways were an economic necessity, though he favoured a gradual withdrawal of some railway services in favour of road transport. He also recommended a general overhaul of railway management to conform with contemporary needs.

As a result of his findings, the Transport Act of 1938 was passed, which set up the Commission. That body now consists of a full-time Commissioner appointed for not less than three or not more than five years and two part-time Associate Commissioners. The latter are: (*a*) the Manager of Railways, and (*b*) the Administrator of Road Transport for the time being. Any two members of the Commission form a quorum. The Commissioner, as chairman, has a casting vote. The Commission has power to control all transport by road, rail, water, or air, within the State other than the privately-owned Emu Bay Railway or the Mount Lyell Mining & Railway Co. Ltd. undertakings, or municipal buses or trams.

The Commission is a statutory corporation, which had as its original model, the London Passenger Transport Board. Mr. Baird points out that the Act provides that the Commission shall be free from political control. If the Minister for Transport is dissatisfied with any decision by the Commission, he may appeal to the Governor, whose decision is final. Where any decision of the Commission is reversed the Commission may be reimbursed for any loss incurred. It is required to

charge " reasonably " economic rates and fares, but where the Government considers the charges imposed by the Commission so far as they affect any particular industry are excessive it may direct the Commission to reduce such charges, and may reimburse the Commission for any loss so incurred. The Commission, it is claimed, is free to conduct its administration without political interference. Only in two cases in 19 years has the Minister appealed against decisions of the Commission.

The Commission is divided into the Secretariat Branch; the Railway Branch, which is controlled and managed by the General Manager of Railways, who is also an Associate Commissioner; the Road Transport; Road Transport Operations; Finance; and Marine Branches. Policy and finance are matters for the full Commission, but the general administration of the Railways, Road Transport, and Road Transport Operations Branches is the responsibility respectively of the General Manager of Railways, Administrator of Road Transport, and Manager of the Road Transport Operations Branch.

In the last 10 years, because the administration could not pass on uncontrollable inflationary increases in the costs of wages and materials, there has been a considerable increase in the annual railway deficit despite improvements in operating efficiency and increased traffic. During the financial year 1957-58 there was a considerable reduction in the railway loss due to reorganisation of train services. The policy in recent years has been to abolish uneconomic passenger and branch line services, but the Commission has carried out a vigorous campaign traffic to the more economic services. The General Manager of Railways may determine rates and fares where they vary from the general coaching and goods rates. As an Associate Commissioner he has a vote on matters of general policy. Departmental administration is on the normal railway functional basis.

For the purpose of control of public vehicles the State is divided into eight traffic areas, so designed that competitive operations of vehicles licensed for one area only are confined to short hauls. Licences for the operation of road passenger and goods services may be issued for one traffic area only. Vehicles licensed for one area cannot be used outside this area without the payment of a permit fee, high enough to prevent most holders of licences for one traffic area from travelling outside their area in competition with the railways or a licensed carrier service. Full permit fees are only charged for transporting goods outside the area for which the vehicle is licensed where the proposed journey is in direct and unnecessary competition with the railways or a licensed carrier service.

It is claimed for this system that it not only protects the railways against costly competition and duplication but also gives the road operators considerable protection. At a recent Parliamentary inquiry in Tasmania into transport control the Road Operators' Association did not favour the abolition of the present system but only proposed some modifications. It is surprising that such close regulation of transport should have been accepted by public opinion in the first place, and then continue so long without, apparently, demands for relaxation of restrictions on privately-owned transport.

LETTERS TO THE EDITOR

(*The Editor is not responsible for opinions of Correspondents*)

Passenger Timetables

May 14

SIR,—Most people must have supposed that the maps appearing in British Railways, Eastern Region timetables, were of a makeshift character, temporarily in use while so many changes in the system were taking place. How disappointing it is, therefore, to see in the summer timetable the same diagrams, changed only by elimination of the M. & G.N. Line and closed branches.

At least 10 branches are shown as taking off in the wrong direction. Peterborough is shown with only one station. There is nothing to indicate that where the line from Cambridge to Bedford crosses the Great Northern main line there is Sandy Station, where there might be a connection. The suburban diagram on page 3 gives no station names between Hackney Downs and Waltham Cross.

I do not ask for the elaborate maps of the German timetables, but at least we might have one like that in the Netherlands Railways time book, with fine lines and junctions clearly marked. Could not the cover fold in as in the Danish State Railways and Dutch timetables, so that in planning a journey the map can be opened out and used as an index?

Yours faithfully,
HOWARD DIAMOND

45, St. Barnabas Road, Cambridge

May 19

SIR,—The London Midland Region timetable gets larger and needlessly heavier with each edition. It is high time to consider a radical reform. Possibly a timetable of principal main-line expresses in a folder in the American style and district or area folders for the local services would meet the case.

Table 52 in the 1959 summer edition uses up 16 pages which are of purely local interest. I note the inclusion of the former Great Central Railway main line in the new issue: recognition for Cinderella at last, although the days of the " South Yorkshireman " between Marylebone and Bradford apparently are numbered. A table of the " Waverley Route " trains of the Scottish Region, between Carlisle and Edinburgh via Hawick, is included, but no tables of trains north of Glasgow and Edinburgh. In summer these surely interest more people than do tables of local trains on, say, the Euston and Broad Street to Watford line. In Table 218, entitled " Skipton to Morecambe and Carlisle," no details are given of timings from and to Leeds City. Anyone determined to use the railway for local journeys in the West Riding needs Eastern, London Midland, and North Eastern Region time books.

Yours faithfully,
JOHN W. RATTRAY

58, Wergs Road, Tettenhall, Staffs.

Diesel v. Electric Traction

May 14

SIR,—You publish in your April 17 issue a letter from Mr. L. Irvine-Brown commenting on train performance in the U.S.A. Unfortunately, the " average " train weight of 1,439 tons has been misinterpreted. This is, in fact, the statistical net ton-miles per train-mile and should be associated with a statistical gross ton-miles per train-mile of 3,176 short tons.

Statistics of this nature must be used cautiously. All trains in freight service consisting of more than locomotive and van are included. The statistic, therefore, includes trains with different characteristics: branch-line trains moving perhaps only a few freight cars and shunting on the way, with low train-miles, low gross ton-miles, but many train-hours; 8,000-ton ore trains moving in 30 m.p.h. service where tractive effort is paramount and a low locomotive h.p. per ton of train is normal; and merchandise trains moving long distances at speeds up to 60 m.p.h. where h.p. is important, but extra tractive effort is carried all the way to surmount the incidental gradients of the route. The figure obtained by dividing total gross ton-miles by total train-miles does not represent any typical operation.

It is wrong to assume that a locomotive with less weight per installed h.p. is always a better locomotive. The North American railways may have mountain ranges to cross, but most of their mileage is in good railway country, with long hauls over fairly level track, and incidental gradients up to 1 in 70. For this territory, the optimum power/weight ratio seems to be 15-20 h.p. per ton. Locomotives with higher power/weight ratios would be overpowered or " light on their feet " for freight service.

Yours faithfully,
W. SERGEANT

220, Betournay Avenue, St. Lambert, Montreal, 23

THE SCRAP HEAP

Southend Pier Railway Popularity

The receipts on the Southend Pier during Whitsun are claimed to be an all-time record. Some 55,000 people paid £1,266 to pass through the turnstiles, and the receipts of the 1¼-mile 3 ft. 6in. gauge electric railway were £1,754.

Feed the Staff—Starve the Railway

The collection of railway tickets, long loosely conducted, is now closely watched, and from the financial gain already made, it is perhaps a pity the stricter methods had not been sooner adopted. An amusing example of the old style has been reported. Passengers at a wayside station were seen to pass out of a wicket-gate without tendering a ticket. The stationmaster's excuse was that he was at his dinner. It was a case of starve the line and feed the stationmaster.—*From "The Financial Times" of May* 13, 1899.

Mischief

Because of widespread damage to railway property in Lancashire over the past few weeks, British Railways are to ask parents and teachers to impress upon children the danger—to themselves and to train passengers—of trespassing on the railways.

The incidents include: Stone throwing, which caused dozens of broken windows and injury to a driver and a woman passenger; at Orrell, near Wigan, boys laid baulks of timber on the line and two trains were held up while they were removed; points found jammed with stones at Bolton; at Eccles children rolled a drum down an embankment on to the line; at Manchester Victoria someone released the brakes on a parcels van which ran into Newtown carriage sidings and collided with the buffers.—*From "The Times"*

Bridging the Indus at Sukkur

Reference was made last week to the new bridge to be built at Sukkur, conveying the Rohri-Quetta line of the North Western Railway of Pakistan over the Rohri Channel of the Indus. It is to be about 100 ft. downstream of the existing Lansdowne Bridge, which is to be converted for light road traffic.

The Lansdowne Bridge was completed in 1889 to plans by Sir A. M. Rendel. It is a single-span wrought-iron and steel structure with two anchored cantilevers each 310 ft. long and a central suspended girder of 200 ft., spanning a 790-ft. waterway. The vertical pillars of the cantilevers are 170 ft. high above bearings. At the time of its completion, it was the longest cantilever bridge in the world. As originally constructed, it carried a roadway 16 ft. wide on the same deck central to the railway track, and two cantilevered footpaths. The roadway was removed in 1939 as the bridge was heavily over-stressed. At present, because of defects in substructure and superstructure, the bridge is restricted to the lightest of locomotives at 5 m.p.h., with the result that a traffic bottleneck has been created between the two busy yards at Rohri and Sukkur on either bank.

Hot Air?

This could be the answer to the railways' prayer for help—a wheelless air-propelled coach to skim $\frac{1}{32}$ in. on air above a metal strip. A model of what some experts think is the train of the future was demonstrated at Detroit. Made by the Ford Motor Company, it is called a Levacar. The model, built for just one passenger, has compressed air forced through three metal pads on its underside. Said Dr. Andrew Kucher, who developed it: "It would skim over flat rails, like the present railway tracks at speeds of 200 to 500 m.p.h."—*From the "Daily Express."*

East Suffolk Railway Centenary

The greatest length of railway mileage opened in 1859 on one day was the East Suffolk system, of which some 58 miles were brought into use on June 1. This mileage was made up of various lines between Ipswich and Lowestoft and Yarmouth. The section from Ipswich (East Suffolk junction) to Woodbridge, about 9½ miles, was part of the Eastern Union Railway, and the remainder was owned by East Suffolk Railway, but all was worked by the Eastern Counties Railway.

The Lansdowne Bridge over the Indus at Sukkur, completed in 1889

The opening was described in our predecessor, "*The Railway Times*" for June 4 1859, as follows:—"East Suffolk: This undertaking, which was set on foot in 1855, a small section of it having been partially completed in the previous year, between Halesworth and Haddiscoe, was opened for traffic on the 1st instant. The Eastern Counties work the system, which extends from Ipswich to Yarmouth, a distance of 53 miles, and includes also branches to Lowestoft, Leiston, Framlingham, and Snape. A fifth branch is contemplated to Aldborough, a watering place on the coast, and a bill for the purpose is now before Parliament.... The journey to Yarmouth will be effected in five hours and a half. A testimonial is to be presented to Sir Morton Peto, as a proof of the shareholders' appreciation of the manner in which he has executed the works, he being lessee for 21 years at 6 per cent per annum on the subscribed share capital, in addition to the interest on the debentures."

Good Turn

A Newcastle firm of industrial lubricant manufacturers, Revol Limited, has received an unsolicited testimonial to its Voler graphite compound. At a remote railway terminus in North-West Europe, a locomotive was turned early every morning on the turntable, which emitted squeaks and groans in movement. Local railwaymen used it as an alarm clock. A representative of Revol happened to call at the terminus and oiled the turntable with Voler compound. Next day, the railwaymen were all late for work.

By Candlelight

A recent correspondence in "*Country Life*" has shown that candles were used for train lighting in Britain relatively lately. One reader recalls that when he was a boy in the 1890's, he travelled regularly from a station in Kent on the London Chatham & Dover Railway in four-wheel coaches lighted by oil lamps which gave so feeble a light that businessmen carried in their pockets a small tin box, containing 3-in. of candle, a box of matches, and a socket to hold the candle. Those in corner seats put the box on the window ledge and so could read their evening papers. Another reader recalled a dark evening in 1908, when he changed at Halesworth on the Southwold Railway, and found that the old oil lamps had been replaced by electric light. The long tram-like carriage, however, was lit by three candles, fixed by their own grease to the window sills. The guard said that "those who put it there could come and work it; he did not wish to be blown up." A traveller to Malta mentioned visits in 1913 and 1923, when the railway from Valletta to Citta Vecchia was still in use. There was one tunnel, and just before the train entered it the Maltese guard went along and lighted a candle in every carriage and blew it out at the end of the tunnel.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

SOUTH AFRICA

Coal Traffic in 1958

Final returns of coal moved during 1958 by the South African Railways show that the grand total was 25,922,064 tons, an advance over 1957 of 1,120,163 tons. Transvaal production at 21,395,047 tons was an advance on 1957 of 1,026,866 tons and railings from Natal coal mines increased by 93,297 tons to 4,527,017 tons. Coal for ship purposes showed a small increase of 11,610 tons.

A feature of the year was the additional coal provided for private purposes, including power stations (503,358 tons). The total provided for private consumption was 18,034,660 tons in comparison with 17,531,302 tons during 1957.

INDIA

New N.F.R. 18-mile Relief Line

The section of line from Katihar to Barsoi was part of the former Eastern Bengal metre-gauge line from Parbatipur to Katihar, and from Barsoi the Assam Link branches northwards towards Siliguri. So heavy is traffic between Katihar and Barsoi that relief had to be provided to cope with it. Accordingly, a new 17¾-mile line is being hurriedly constructed from Kumedpur, on the Katihar-Malda branch, to Barsoi, thus providing a loop relief to the direct line. Work was began only in January, and, it is intended that the line will be open for traffic in June. This is being made possible by the building of temporary timber pile bridges. The estimated cost is about £875,000.

Diesels Relieve Pressure of Coal Traffic

Preliminary to electrification, already in hand on the Durgapur-Gaya section, the 43 diesel-electric locomotives recently delivered to the Eastern Railway are already hauling heavy coal trains over the Grand Chord line, Dhanbad-Gomoh-Gaya, which is heavily graded. They are also working similar trains onward from Gaya to Moghalsarai and others between Barkakana, Sonenagar and Moghalsarai. This latter traffic traverses the Gomoh-Barkakana - Daltonpur - Barwadih - Sonenayar loop line tapping the Karanpura Coalfield. The additional coal traffic from Barkakana to Sonenagar has necessitated the construction of no fewer than 22 new crossing stations on this 150-160-mile section. A new diesel repair shop has been built at Gaya, and Moghalsarai yard is being remodelled to handle 3,000 wagons each way daily before March, 1961. It will have automatic electrically-worked points and electro-mechanical retarders.

SOUTH AUSTRALIA

Completion of Gauge Conversion

The conversion of the South Eastern Division of the South Australian Railways from 3 ft. 6 in. to 5 ft. 3 in. was finally completed in March with the cessation of narrow gauge services on the Naracoorte-Kingston branch.

The last 3-ft. 6-in. gauge train left Kingston for Naracoorte on March 13 and on March 16, 5-ft. 3-in. gauge diesel railcars took over the service, connecting at Naracoorte with the day trains between Mount Gambier and Adelaide.

The main part of the project was commenced in 1945. This was the conversion of 114 route miles of track between Wolseley and Mount Gambier. It was completed in stages finally reaching Mount Gambier in 1953. This gave through connection with Adelaide obviating the change at Wolseley.

The branch line from Mount Gambier to Millicent, a distance of 29 miles, was completed in 1955, and the section on to Beachport was closed. A short branch to Glencoe, formerly worked from Mount Gambier, was also closed. The branch from Naracoorte to Kingston, just completed, is 52 miles in length.

The method of conversion was to build a new three-rail track for use by trains of both gauges as was done on the larger portion of the project. Now that narrow gauge operation has ceased, the inner rail, used only by 3-ft. 6-in. gauge trains, will be removed.

VICTORIA

Abolition of Level Crossings

Wherever practicable level crossings are to be eliminated on the Melbourne-Wodonga standard-gauge route, and it has been decided to construct road overpasses at five points. Two of these are in the outer suburban area and three in country areas.

The route of the present line to Sydney, through the suburban area, is directly north from Melbourne to Broadmeadows, which is the end of the suburban network. The future standard-gauge line will reach Broadmeadows by swinging away through the western suburbs of Sunshine and Albion and then alongside the Albion-Broadmeadows goods line. A major level crossing at Sunshine and another at Albion are to be replaced by road overpasses, which will assist in smoother operation of the new line,

A few miles beyond Broadmeadows the railway crosses the Hume Highway at Craigieburn, and a road overpass is to be constructed there, while at Tallarook, 56 miles from Melbourne, another overpass will be built to carry the same highway over the line. The third country overpass will be to eliminate a level crossing in the town of Euroa, about half way between Melbourne and Albury.

The question of avoiding other crossings farther north by deviating the Hume Highway to a new alignment on the eastern side of the railway in the Chiltern-Barnawartha area is being considered, and enquiries are being made into abolishing three level crossings in the town of Wangaratta.

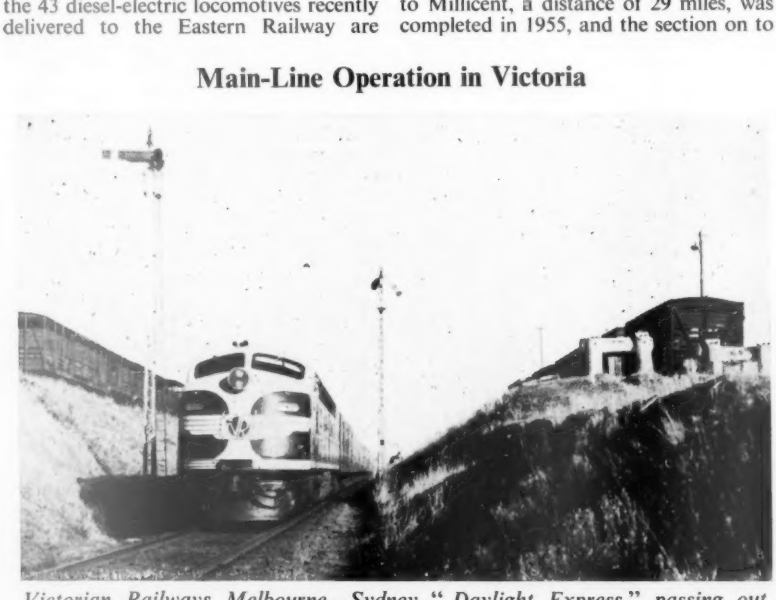
NEW ZEALAND

Road and Rail Ferry

The New Zealand Government has finally decided to call tenders for a 4,000 ton vessel to carry road, rail, and passenger traffic between Wellington and Picton, the terminals of the North and South Islands. A decision has been reached by the Cabinet to have the vessel designed and to issue a world-wide invitation for tenders to construct it. The ferry will be operated by the Railways Department.

An officer of the Railways Department and an officer of the Marine Department will leave soon for the United Kingdom and the Continent to examine the design and operation of similar vessels owned and operated by railway concerns overseas. The basic design plans and speci-

Main-Line Operation in Victoria



Victorian Railways Melbourne—Sydney "Daylight Express" passing out of the marshalling yards at Wodonga; high-level sidings (left), with 5-ft. 3-in. rolling stock, and (right), New South Wales standard-gauge stock

fications for the new vessel will be prepared at once by the Marine Department in co-operation with the Railways Department. A United Kingdom firm of consultant naval architects and marine engineers will then be engaged to invite tenders from shipbuilders throughout the world to advise on the tenders received and supervise construction of the vessel. It will have a length of 300 ft., and a speed of from 18 to 20 knots. It will be one of the drive on-drive off type, with facilities for some 1,200 passengers on daylight sailings. Besides facilities for road vehicles it will be equipped with rails to carry railway wagons.

The vessel will accommodate 80 motorcars, or 40 motorcars when loaded with 18 to 20 railway wagons. The vessel would be controlled by the Railways Department which has country-wide facilities readily adaptable for booking cars, freight, and passengers and is administratively equipped to handle financial control, to fix freight structures, and to administer a sea service in close co-ordination with rail transport.

New Wagons in Traffic

The placing in traffic of 2,300 all-steel high-side open wagons of 15 tons capacity each, ordered from Metropolitan-Cammell Carriage & Wagon Co. Ltd. in 1956, was completed in March. The North Island received 1,800 of these wagons, which began to enter traffic in 1957, and 500 were added to South Island stock last year. Other wagons added to stock between April, 1958, and March, 1959, included 186 all-steel bogie insulated meat wagons, 50 low-side open wagons, and 35 bogie. side-dump wagons. A total of some 12,500 wagons out of the present fleet of 35,000 has been placed in traffic since March, 1946.

CANADA

Piggyback Service

A piggyback service between Montreal and Fredericton, New Brunswick, was commenced at the end of May by Canadian National Railways using railway-owned trailers, including refrigerated trailers for perishable goods. Facilities for loading and unloading the trailers from railway flat wagons are located at McGivney on the Montreal-Halifax main line, from where the trailers will be hauled by road to Fredericton, Oromocto, Camp Gagetown, and other points. The service between Montreal and Fredericton will permit connections with Toronto, Hamilton, London and Windsor, and is part of a growing integrated service linking Central Canada and the Atlantic provinces.

UNITED STATES

New York-Washington Service

In an endeavour to meet the increasing inroads of road competition on its electric service between New York, Philadelphia, Baltimore and Washington, the Pennsylvania railroad effected some considerable accelerations of its trains on April 26. Hitherto apart from the "Afternoon Congressional" each way in 3 hr. 35 min. and two other trains each way in 3¾ hr., the times of the hourly service between New York and Washington have varied in most cases from 3 hr. 50 min. to 4 hr. As a result of the April 26 speed-up, 18 trains now made the journey in 3¾ hr. or less, with 5 to 35 min. cut from the previous schedules.

The distance is 224.8 miles, and all the hourly expresses call at Newark, North Philadelphia, 30th Street Philadelphia, Wilmington, and Baltimore, and most also at Trenton, so that a 3¾ hr. schedule at 60 m.p.h. average, demands high intermediate speeds. Station stops are being substantially cut as the result of an agreement with the U.S. Post Office, that 38 of the daily trains between New York and Washington no longer carry mails. Six of the slower trains on the service still handle mail, but the bulk of the mail is now carried on six special trains reserved for mail and express traffic only.

Infra-red Coal Wagon Heating

The Western Maryland Railroad has put infra-red heating to a novel use in its dockside yard at Baltimore, where export coal is loaded into ships from the railway wagons. In winter coal dumping through wagon bottom doors is hampered when the wagon contents get frozen. Batteries of 1,600-W. and 3,800-W. quartz infra-red lamps have, therefore, been installed on both sides of the track at the dumping dock, with the greatest concentration of heat at the bottom of the wagon, above the doors. The equipment can thaw out the contents of six bogie coal wagons an hour.

SWITZERLAND

Arth-Rigi Railway

The rack-and-pinion railway between Arth-Goldau and Rigikulm has an extension, 1½ miles long, from Arth-Goldau down to Arth, on the Lake of Zug, opened in 1875. After six years of rack operation, in 1881 the rack was removed, and since then single-car units have operated over its 1 in 15 gradient by adhesion. From October 4, the trains are to be replaced by motorbuses, and the track removed.

Publications Received

Rectifier Equipment.—Three leaflets issued by the Hackbridge & Hewittic Electric Co. Ltd., of Walton-on-Thames, Surrey, explain the individual merits of rectifiers of the cooled-cathode, germanium and silicon, and oil-immersed selenium, germanium, and silicon types. Among advantages claimed for cooled-cathode rectifiers of sub-station capacities up to 5,000 kW., are increased output for less space and ease of installation compared with previous designs of mercury arc rectifier. By anchoring the cathode spot at a line of contact between the mercury and a molybdenum ring attached to a metallic base sealed into the glass bulb, less heat is evolved and less mercury is needed. Diagrams show the comparative sizes and it is further explained how radial fins are formed on the metal base to simplify the control of air-draught cooling. A feature of the leaflet concerning germanium and silican rectifiers is the detailed description of the metal-refining and other processes used for manufacturing diodes. There is a description of the design considerations to limit temperature, over-current, and over-voltage with these types of rectifier. Oil-immersed rectifier equipment is stated to have higher first cost but it has greater versatility in that it can be mounted in any atmosphere or out of doors. For small equipments the transformer is shown contained in the same tank. Throughout the three leaflets there are numerous examples of railway electric supply applications both for traction and workshop duties and a fourth leaflet is devoted to illustrations showing a selection of typical Hewittic metal rectifier equipments.

Brush and its Products.—A 19-page publication produced by the Brush Electrical Engineering Co. Ltd. describes the company's products beginning with some information also on its formation in London in 1879 with the name Anglo-American Brush Electric Light Corporation, after Charles Francis Brush, the American inventor *inter alia* of the electric arc lamp. The present factory at Loughborough was built in 1889. Products now being built there and illustrated in the publication include steam turbines, turbo-alternator sets, power and distribution transformers, h.t. and l.t. switchgear, fusegear, and high-breaking-capacity fuses, induction motors up to 5,000 h.p., alternators up to 5,000 kVA., d.c. machines up to 2,000 kW., and air-cooled turbochargers for diesel engines up to 3,000 b.h.p. A section is devoted to Brush diesel-electric locomotives incorporating engines by the associated companies, Mirrlees, Bickerton & Day Limited and the National Gas & Oil Engine Co. Ltd. The locomotives are designed for shunting and main-line duties in all parts of the world and range in power from 180-3,000 h.p. There are illustrations showing a main electrical control cubicle, a traction generator with double-reduction gearing for a shunter, and a main 820 kW. d.c. traction generator. Typical Brush locomotives shown include a 1,250 h.p. A1A—A1A diesel-electric main-line version (British Railways Type "2"), hauling a passenger train on the Eastern Region.

Oil Suction and Discharge Hose.—George Angus & Co. Ltd. has issued a nine-page catalogue, "Angus Oil Suction & Discharge Hose," in which are fully described hoses manufactured to suit a wide range of bulk-handling duties. On the first page is an index showing, in tabular form, the types and grades of hose related to specific British Standards with notes on general applications. The catalogue includes cut-away views to illustrate the multi-layer construction used and to explain the addition of a wire spiral in the bore of hoses used for fuels of exceptionally high aromatic content. Copies may be obtained from George Angus & Co. Ltd., Newcastle-upon-Tyne, 1.

Ambulance Cars for Pilgrimage Traffic

Converted saloons with kitchen facilities for conveying stretcher and sitting cases

UNTIL this year patients travelling by train in Britain to and from Channel ports on pilgrimages to Lourdes have been carried in W.D. cars. Three of these vehicles contained 24 berths, and two 12 berths. The latter also provided for sitting cases besides toilet and kitchen amenities. They were originally fitted for the War Department in 1943, and in recent years have been hired by the British Transport Commission for pilgrimage traffic.

Saloons Converted

As the life of the cars had virtually expired, British Railways decided to provide this service themselves by converting saloons withdrawn from passenger traffic. This has been achieved by using four vehicles instead of five, but with the same number of berths accommodated in the new stock.

The conversion of four saloons was undertaken by the Southern Region Lancing Carriage & Wagon Works. The vehicles were used for the first time by the National Pilgrimage from Victoria on May 4.

Kitchen Facilities

Each has been fitted to provide for 24 stretcher berths and 11 sitting cases. They have the standard toilet at one end. The brake end is fitted with kitchen amenities: food storage, ice cupboard, propane gas cooker, washing sink with hot and cold water, propane gas water heater, roof water tank of 150 gal. capacity (drinking), general purpose cupboard, and folding table.

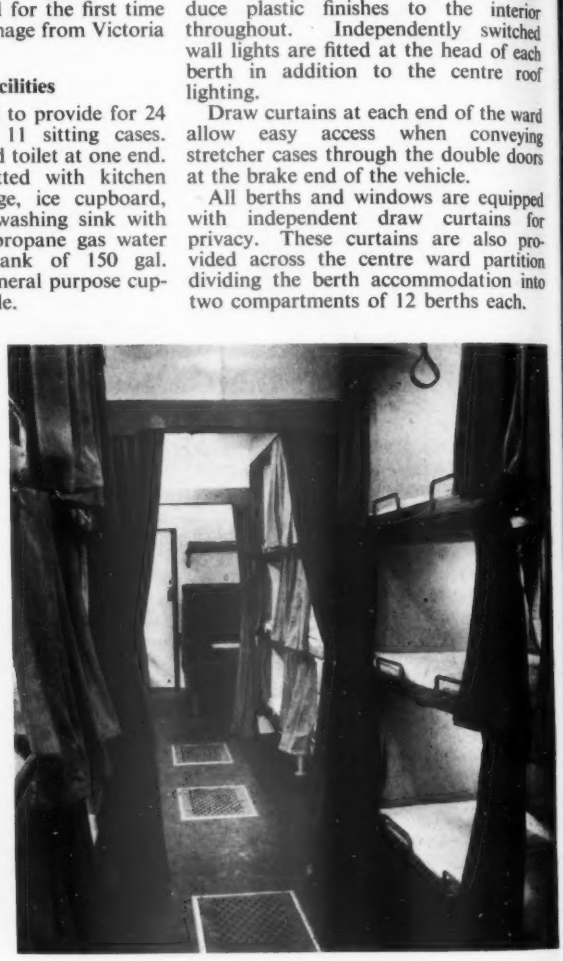
The centre of the vehicle is fitted to provide 24 berths in three tiers. The berths have sprung frames arranged for handling stretcher cases.

The opportunity was taken to introduce plastic finishes to the interior throughout. Independently switched wall lights are fitted at the head of each berth in addition to the centre roof lighting.

Draw curtains at each end of the ward allow easy access when conveying stretcher cases through the double doors at the brake end of the vehicle.

All berths and windows are equipped with independent draw curtains for privacy. These curtains are also provided across the centre ward partition dividing the berth accommodation into two compartments of 12 berths each.

View from brake end, showing propane gas cooker and part of ward



Ward with 12 berths in tiers on either side of the centre partition

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APPOINTMENTS BUREAU FOR PROFESSIONAL ENGINEERS.—As a result of discussions between the Council of the Engineers' Guild and the Board of the Professional Engineers Appointments Bureau, it has been agreed between the two bodies that the functions of the Bureau shall be transferred to the Guild, which will carry them on in future. An appointments division will be created in the Guild Office to carry out these functions for corporate members, graduates and students of the Institutions of Civil, of Mechanical, of Electrical and of Chemical Engineers, and the present Registrar and Secretary of the Bureau, Mr. J. Muil, M.I.E.E., and Assistant Secretary, Mr. H. Bailey, are being invited to join the Guild secretariat as Registrar and Assistant Registrar respectively of the new division. The work of the division will be controlled by a Professional Engineers Appointments Board, appointed by, and responsible to, the Council of the Guild. Final details of the transfer are still being discussed and a further statement will be made in due course including the names of the members of the profession who have been appointed to form the new Board. It is hoped that the new arrangements will take effect on June 1, but the appointments division will continue to operate from the present address of the Bureau, 39 Victoria Street, London, S.W.1 (tel. Abbey 1737).

PAKISTAN STANDARDS INSTITUTE.—The Government of Pakistan has formed a Standards Institute. The objects include: (a) preparation and promotion of the general adoption of standards on national and international bases relating to structures, commodities, materials, and so on; and (b) establishment of laboratories in Pakistan for testing commodities and industrial products. Committees have been appointed of representatives of manufacturers, consumers (both Government departments and in private industry), and the technical staff of the Institute. The Pakistan Standards Institute is a member of the International Standards Organisation.

Russian 3,000-h.p. Diesel-Electric Goods Locomotive

Haulage of 2,160-ton trains at 52 m.p.h. on level and 15 m.p.h. up gradients of 1 in 110

(By a correspondent)

The rapidity of the progress made in changing from steam to diesel and electric traction in Russia is shown by the fact that the annual production of both types of locomotives has increased from 377 in 1956 to 1,056 in 1958, with a target of 2,500-2,700 in 1965. Whilst at the present rate of construction a total of 3,000,000 h.p. is provided by new forms of traction, this value should be increased to about 9,000,000 h.p. a year by 1965. At the same time, whilst 10.4 and 15.6 per cent of the traffic is at present handled by diesel and electric traction respectively, these values are to be increased to 43 and 44 per cent by 1965. The change-over will require some 13,000 main-line and shunting diesel, and 5,000 electric locomotives.

Preference for Electrical Transmission

The development of diesel locomotives so far has culminated in the large-scale production of the Class "TE.3" 4,000-h.p. Co - Co + Co - Co-locomotives.[1] Operating experience with these proved them to be generally satisfactory, but in the course of further evolution it was found desirable to concentrate on the development of 3,000-h.p. Co-Co locomotives provided with electric or hydraulic transmissions.[2] Alternative designs are under active consideration and construction of prototypes is now in hand.

It seems that despite heavier weight and possibly higher first costs, preference is given to electric transmission, mainly because of generally satisfactory and trouble-free performance and the greater freedom afforded as far as the arrangement of major components is concerned.

The first of the new locomotive type known as Class "TE.10" has been built as a heavy goods locomotive with a maximum speed of 62.5 m.p.h., capable of handling 2,160-ton trains at 52 m.p.h. on the level and 15.3 m.p.h. up 1 in 110 grades.

The prototype single-engine 3,000-h.p. Co-Co locomotive was designed by the Kharkov Locomotive Works in collaboration with the Chair of Locomotive Design at the Kharkov Polytechnic and became available for testing on line early in November, 1958.[3] Running-in was carried out on the Osnova-Red Liman section of the Southern Railway, and at present the locomotive is in service on the Liski section of the South Western Railway.

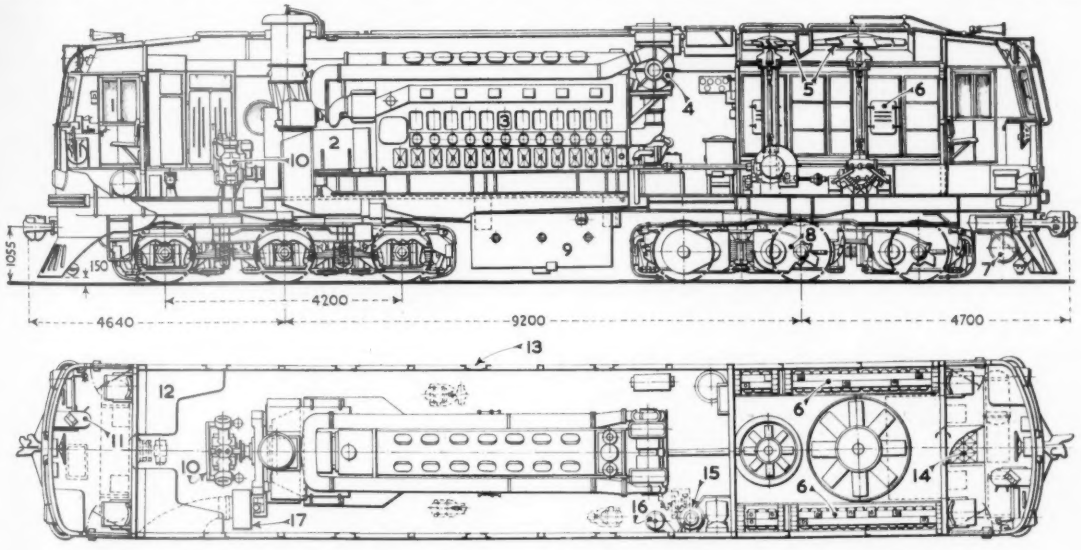
Diesel Engine

The locomotive is powered by a Type "9D100" two-stroke opposed-piston in-line engine designed generally along the lines adopted with the type 2D100 engine as used with Class "TE.3" locomotives.[1] The number of cylinders is increased from 10 to 12. While the bore and stroke remain unaltered at 207 mm. and 2 x 254 mm., respectively, and the maximum and minimum speeds are limited to 850 and 400 r.p.m., respectively, the charge pressure was increased from 5 to 15.35 lb. per sq. in. gauge. The air temperature at engine intake has been reduced by more effective inter-cooling from 158°F. to 130°F. The engine is charged in two stages. The first stage comprises two exhaust-driven turbo-chargers. The second stage consists of a single centrifugal blower driven off the power take-off gear at the front end of the engine. The complete engine weighs 19 tons.

Electrical Equipment

The main generator is a type MPT.120/49 non-compensated 10-pole force-ventilated unit with independent excitation developing 2,000 kW at 470/650 V. and 4,200-3,080 A., and weighing 9.2 tons. Silicon insulation has been used throughout. The brush holders can be rotated to facilitate inspection. The main generator excitation is of a novel type employing a three-phase synchronous generator type GSV.20, developing 20 kW. at a frequency of 400 cycles per sec. and 1,500 r.p.m., and a control amplifier comprising an amplistat and semi-conductor rectifiers. The excitation generator is connected to the main generator via a transformer, the amplistat, and a rectifier bridge. Each of the type EDT-370 axle-hung traction motors develops 307 kW. at 475/650 V. and 700 A. The maximum speed is limited to 2,240 r.p.m. The use of silicon insulation resulted in a motor weight of 2.9 tons. The specific weight is thus only 21.2 lb. per kW., compared with about 36 lb. per kW. for the motors of Class "TE.3" locomotives. The motor field is provided with two shunt steps, ensuring a field weakening of 50 and 35 per cent, shunting being automatic.

The transmission circuit permits the utilisation of the full engine output

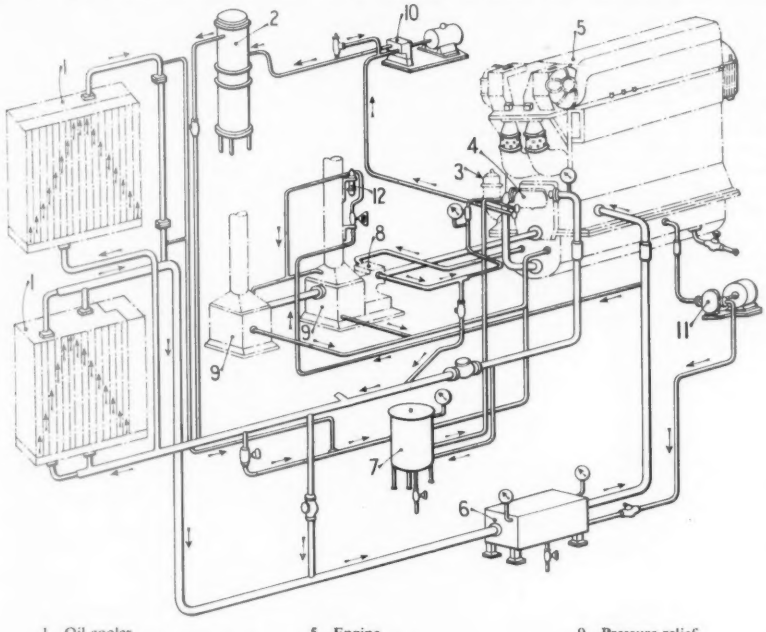


1 Driver's cab
2 Main generator
3 Engine Type 9D100
4 Turbocharger
5 Cooler fans
6 Coolers
7 Air reservoir
8 Traction motor
9 Fuel tank
10 Compressor
11 Controls
12 High voltage chamber
13 Body
14 Battery
15 Boiler
16 Fuel heat exchanger
17 Traction motor blower

Sectional side elevation and plan of Class "TE.10" U.S.S.R. Railways 3,000-h.p. diesel-electric locomotive

throughout the entire speed range, whereas with the earlier Class " TE.1," " TE.2 " and " TE.3 " locomotives designed for maximum speeds of 56.5, 58, and 62.5 m.p.h., utilisation of full engine power was limited to road speeds of about 25, 37.5 and 45 m.p.h., respectively.

At the same time the overall locomotive efficiency has been increased to 30.2 per cent compared with 24, 25, and 28 per cent in the case of the above-mentioned three types, respectively. The total weight is now 103 lb. per b.h.p. compared with 270, 190, and 140 lb. per b.h.p. The maximum power at the wheels is limited to 2,315 h.p. The relatively high overall efficiency was in the main achieved through improved engine and transmission efficiency and reduced auxiliary power requirements, the transmission efficiency being about 85 per cent in the operating speed range.



1 Oil cooler
2 Oil warming heat exchanger
3 Centrifugal oil filter
4 Pump
5 Engine
6 Coarse filter
7 Fine filter
8 High pressure pump
9 Pressure relief
10 Auxiliary pump
11 Circulating pump
12 Unloading valve

Lubricating oil circuit

Weight-Saving in Body Structure

To avoid exceeding the total weight of 138 tons, the locomotive body has been designed as a single-shell unit consisting of the underframe, sides, and fixed portion of the roof. The underframe is made up of two 12½-in. high box-section longitudinals and suitable cross-members, whilst the sides incorporate a single 12⅝-in. high, box-section longitudinal and 3-mm. steel plates. In this way it was possible to save some 4.5 tons in the body structure.

The 32.15-ton engine-generator set is in the middle of the locomotive. The Type " KT.7" brake compressor is mounted at the generator end, from which it is driven via a semi-elastic coupling. The centrifugal blower for the traction motors is driven by vee belts from the generator shaft. The axial flow blower and bevel drive provided to ensure main generator cooling are mounted on the commutator end. The two high-voltage control cabinets are in the cab adjoining the generator.

The cooling system is assembled at the rear end of the locomotive. This consists of the cooling system components for engine coolant, oil, and for the cooling of the charge air. The cooling air flow is maintained by two fans driven from the lower engine crankshaft via a distributor and a two-speed gearbox. The traction motor blower for the rear bogie is also mounted near by, as is the boiler for warming up the cooling circuits in cold weather.

The cooling radiators are made up of individual sections consisting of 28 sections for engine coolant, 10 for charge air coolant, and 46 sections for engine oil cooling. The cooling area of the engine coolant and oil are 6,150 and 9.600 sq. ft., respectively. The fan rotor is about 5 ft. in dia., running at a maximum speed of 980 or 1,255 r.p.m. depending on the gear ratio of the two-speed gear, the power absorption being 44 or 85 h.p. respectively. Temperature control is maintained with a temperature-sensitive relay and friction clutches. The Nife type batteries installed below the floor of the rear cab and the cooling compartment are electrically heated in cold weather.

The locomotive carries 6.5 tons of fuel, 1.45 tons of lubricating oil, 1.5 tons of cooling water, and 0.7 tons of sand. The fuel capacity is sufficient for 500 miles with a 2,160-ton trainload.

The bogies are redesigned on the basis of experience with " TE.3 " locomotives. The frames are extended and strengthened to accommodate clasp brakes. The cast end and centre beams are welded to the fabricated side members. The clasp brakes ensure a brake ratio of 0.73 which ensures a stopping distance of 2,300 ft. when braking from 62.5 m.p.h. on the level.

Suspension

The primary suspension consists of beams carried on top of the roller bearing axleboxes. The outer ends of the outer beams support the bogie frame by means of helical springs. The beams of the three axles are on each side connected by half-elliptic springs incorporating nine leaves, 120 mm. wide and 16 mm. thick, which act as equalisers. The static deflection of the suspension is 2.825 in. This, though an improvement on the corresponding value of " TE.3 " locomotives, will be hardly adequate to ensure entirely satisfactory ride qualities. Even so, the dynamic load augment, which for a 20-mm. obstacle was 11 per cent with " TE.3," has now been reduced to 9.3 per cent. Previous experience with " TE.3" locomotives indicated that the lateral forces encountered when running through curves were on the high side.[4] To reduce these forces elastic elements have been incorporated between the axles and axlebox housings along lines similar to those used with General Motors diesel locomotives and also with Alsthom and S.L.M. electric locomotives, incorporating six-wheel bogies. As mentioned previously,[1] Russian railway assess the curve-negotiating qualities of locomotives on the basis of the resultant lateral deflections imposed on the rails. This method, though very simple, has much in its favour in terms of practical railway engineering.[5] The relevant data as applicable for the " TE.10 " locomotive are summarised in the table below.

Curve Radius (ft.)	Super-elevation (in.)	Permissible speed m.p.h.	Lateral Displacement (in.)	
			permissible	calculated
2,130	3.55	62.5	0.257	0.192
2,630	4.73	75.0	0.257	0.207

As far as the axleload of 23 tons is concerned, this in conjunction with the 3-ft. 5½-in. wheels results in a ratio of 6.65 tons/ft. which is much higher than the limits considered as acceptable in Britain. The complex considerations required to appreciate fully the relation between the dynamic pattern of locomotive behaviour and the stresses imposed on the permanent way can scarcely be expected to be embraced by such oversimplified relations as a ratio between static axleload and wheel diameter.[6]

6,000-h.p. Goods Locomotive

Construction is under consideration of a two-unit Class " TE.11 " goods locomotive developing 6,000 h.p. and capable of a maximum speed of 75 m.p.h. and a two-unit Class " TE.12 " passenger locomotive also developing 6,000 h.p., but for a maximum speed of 100 m.p.h. With this the axleload will be limited to 20 tons, requiring an additional axle between the two bogies.

(*Continued on page* 622)

Rubber Suspension and Shock Absorption Research

New laboratory to evaluate the engineering properties of bonded rubber-to-metal units, and to test railway rolling stock production components

Metalastik office and research building at Leicester where rubber vibration damping and suspension units are developed and tested

THE discovery that soft rubber could be bonded to metal was made some years before 1937, the year when Metalastik Limited was formed by the John Bull Rubber Co. Ltd. But then, rubber bonding as a commercial process was still in its infancy and little was known about the properties of components which utilised this principle. Since 1937, many changes have taken place both in the types of natural and synthetic rubber developed by the company's chemists, and in the range of functional performance requirements.

This month, 22 years later, a new office and research block has been opened by Metalastik Limited at Evington Valley Road, Leicester. There, problems of unlubricated movement, vibration, shock-absorption, and misalignment of suspension units, are dealt with in a programme of testing and research intended to ensure that the products of the company meet the changing needs of motor vehicle and railway rolling stock manufacturers.

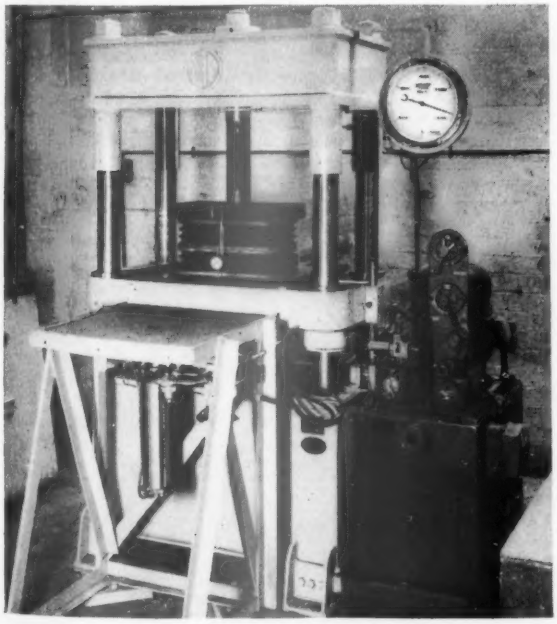
Apart from development work, the Research Department records the properties of manufactured components and it is responsible for devising the control tests which ensure uniformly high quality.

Bogie Suspension for Underground Trains

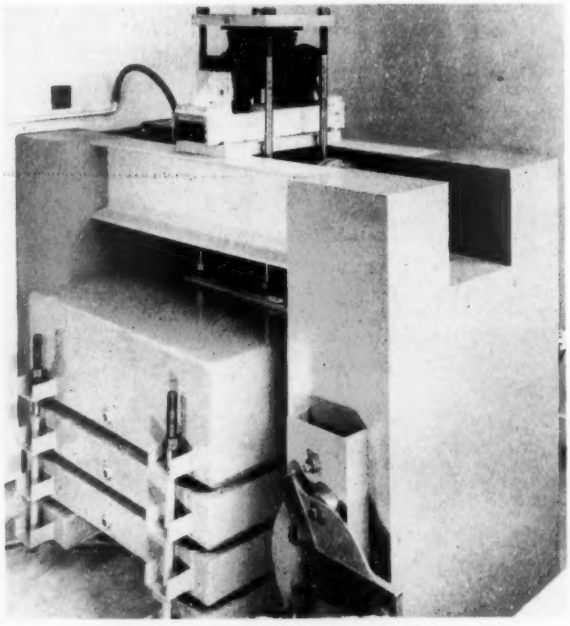
Typical Metalastik products are the rubber bolster and axlebox suspension units developed in conjunction with the Chief Mechanical Engineer (Railways), London Transport Executive for the 76 Metropolitan Cammell lightweight seven-car underground trains ordered in 1958 for the Piccadilly Line. The prototype was described in our October 25, 1957 issue. The elimination of metal-to-metal friction in their suspension was intended to give improved riding, greater silence, and economy of operation by a reduction in the lubrication maintenance compared with conventional springing.

Fatigue Testing Bolster Suspension

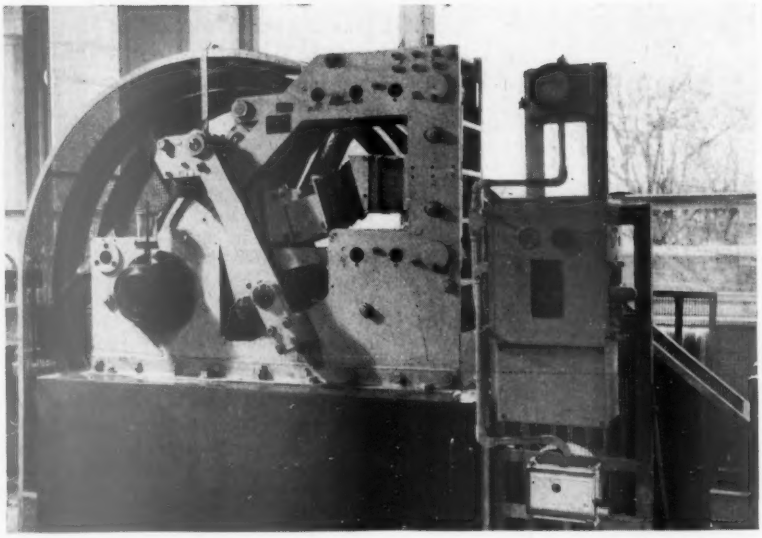
The fatigue testing of bolster suspension units under simulated service conditions is shown in one of the illustrations. The machine can test single springs, or two in series can be fitted. The loading is applied through a crankshaft with a variable stroke mechanism resembling a locomotive valve gear. The horizontal links above and below the test specimen resist the compression forces which, in



Large anti-vibration sandwich mountings being tested for stiffness under a load of 24,000 lb.



Suspension units subjected to oscillating loads from concrete blocks to obtain data for resonance curves



Simulating service conditions for bogie bolster suspension units used on London Transport underground rolling stock

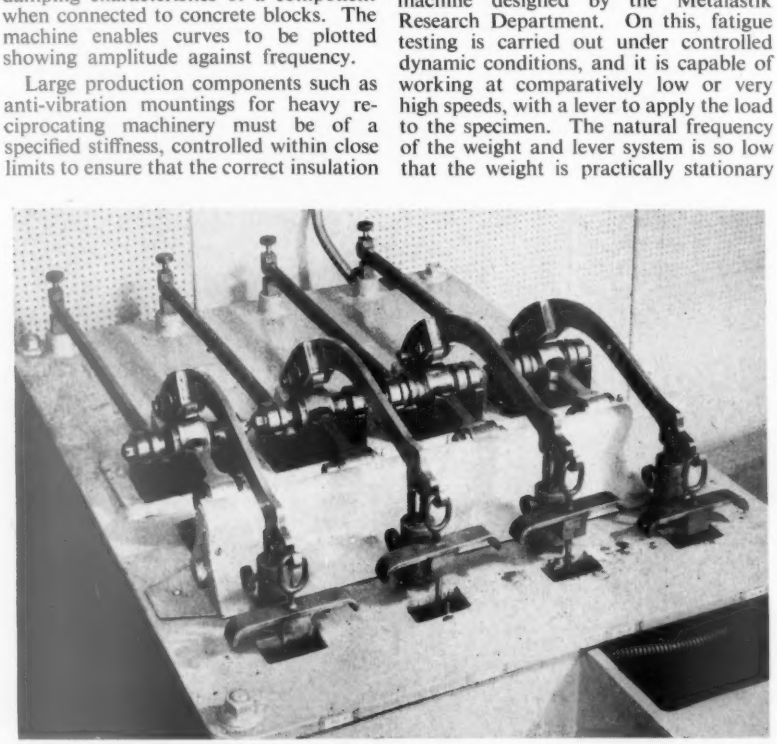
practice, are balanced by the opposing spring on the other side of the bolster or axlebox. The variable stroke and flywheel enable the machine to be started with a minimum of power. The speed of operation is 160 cycles per min. which is slow enough to avoid misleading types of failure due to internal heat generation rather than true fatigue.

Also in the laboratory there is a machine for carrying out dynamic stiffness tests by checking the vibration-damping characteristics of a component when connected to concrete blocks. The machine enables curves to be plotted showing amplitude against frequency.

Large production components such as anti-vibration mountings for heavy reciprocating machinery must be of a specified stiffness, controlled within close limits to ensure that the correct insulation characteristics are provided. In one of the illustrations, the two sandwich mountings shown on test are under a load of 24,000 lb. Components such as these can absorb heavy shock loadings and they permit relative movement to occur without lubrication.

Engine mountings and other relatively small bonded rubber-to-metal components such as body mountings can be tested under compression or shear or a combination of both on another special machine designed by the Metalastik Research Department. On this, fatigue testing is carried out under controlled dynamic conditions, and it is capable of working at comparatively low or very high speeds, with a lever to apply the load to the specimen. The natural frequency of the weight and lever system is so low that the weight is practically stationary when the machine is running. Loading may be up to 1½ tons and movement up to ±¼ in. In practice, wherever possible, the mountings are loaded in shear and compression because this combination provides better load/deflection characteristics.

The combined radial and torsional loads imposed on the bushes fitted in the pivots of vehicle suspension links and in shaker screens and vibrating conveyors are reproduced on the fatigue testing machine shown in the lower illustration on this page. Four bushes can be tested simultaneously each under different loads. This enables an accurate assessment of the useful life of new and modified designs of bushes to be obtained with the greatest possible speed.



Fatigue testing bushes for suspension pivots : radial and torsional loads can be varied individually for each of four simultaneous tests

Problems of Damping

The inherent properties of rubber for use as a springing medium include its ability to maintain a given stiffness over long periods, the absence of permanent set, and resistance to repeated changes of loading without fatigue failures. Much research work remains to be done in the field of damping especially for bogie bolster springing. Experience has shown that the grades of rubber available at present do not give enough damping to avoid the build up of excessive amplitudes at critical speeds. One of the more recent developments by Metalastik Limited is the use of an intermediate plate in bolster springing units to provide a self-adjusting friction damper. This may be found to be a satisfactory compromise for use until rubber compounds have been developed which have sufficient internal energy absorption, but it is most unlikely that such compounds will be available commercially within the next five years.

Russian 3,000-h.p. Diesel-Electric Goods Locomotive

(*Concluded from page* 620)

Meanwhile, the Kolomna Locomotive Works completed the prototype Class "TE.50" locomotive of 3,000 h.p. powered by a new type D.45 engine. The Lugansk Locomotive Works is completing a 3,000-h.p. locomotive with hydraulic transmission powered by four type M.750, 750 h.p. engines. In hand at present are also the designs of 3,000 h.p. locomotives incorporating electric and hydraulic transmissions and capable of 87.5-100 m.p.h. as well as of 3,500-h.p. locomotives powered by two high-speed engines and fully sprung motors for speeds of 87.5-100 m.p.h.

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[1] "Soviet Type 'TE.3' Diesel-Electric Locomotive," *Diesel Railway Traction*, January, 1958

[2] "Diesel Economics in the U.S.S.R.," *Diesel Railway Traction*, December, 1958

[3] A. A. Kirnarsky and A. E. Smolianinov, "New Freight Thermomotive TE.10," *Shelesnodorozhni Transport*, March, 1959 (in Russian)

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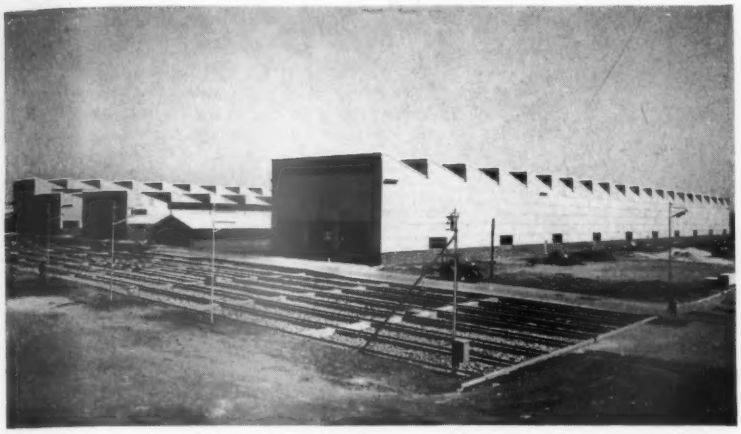
[5] E. Upmark, "Development of Electric Traction in Sweden," *Journal Inst. of Loco. Engineers*, No. 261 (1958-59), page 36

[6] J. L. Koffman, "Spring Stresses and Deflections," *The Railway Gazette*, January 30, 1959 ; J. L. Koffman, "The Effect of Suspension Design on Rail Stresses," *The Railway Gazette*, March 27, 1959

Carriage Building Workshops at Nigel, Transvaal

Speedy construction of works for an enterprise backed by international interests



General view of workshops shortly after completion : main structural shop on right and traverser tracks in foreground

WHEN, in June, 1958, a contract was awarded to the Union Carriage & Wagon Co. (Pty.) Ltd., for the design, building, and supply of 322 officials' coaches for the South African Railways & Harbours Administration, the company had not completed the acquisition of land for its workshops, and yet by mid-January this year, one week ahead of schedule, the buildings were finished and cranes installed ready for production to begin. This was achieved despite almost a month's statutory building-trade close-down during the Christmas holidays.

Land was obtained at Vorsterkroon, an industrial township in Nigel, some 40 miles south-east of Johannesburg.

Levelling and preparation of about half the 70-acre site was finished early in July, 1958, when the buildings contract was let with the target completion date agreed on penalty. Some 1,400 tons of fabricated steel were used in the buildings, covering an area of approximately 123,000 sq. ft. and in open areas served by overhead gantry cranes. Leading dimensions of the buildings are as follow:

Main structural shop ...	600 ft. long × 63 ft. wide
Works offices	96 ft. long × 37 ft. wide
High tension switchroom	32 ft. long × 20 ft. wide
Low tension switchroom	32 ft. long × 20 ft. wide
Air compressor house ...	45 ft. long × 27 ft. wide
Stores building and yard	510 ft. long × 63 ft. wide
Trades shop	510 ft. long × 63 ft. wide
Carriage shop	600 ft. long × 63 ft. wide
Prime paint shop, two buildings, each	50 ft. long × 50 ft. wide

A steel storage yard, covered by a gantry 270 ft. long by 60 ft. span, also was provided, and a traverser of 70 ft. span 590 ft. in length was built for transfer of vehicles between the various production buildings. A complete interconnecting vehicular road system between working areas and shops for the transport of materials has been installed.

As these works were situated in a new industrial area, it was necessary for a new 2¼-mile rail link to be laid from Nigel Station to the site, and electricity, water, and sewerage services provided to meet the scheduled production commencement dates.

The Administration Office Block and Amenities Block are in the course of construction and are the only remaining buildings to be completed.

The Union Carriage & Wagon Co. (Pty.) Ltd., was registered in South Africa in 1957 with a majority holding of shares by the parent company, Commonwealth Engineering Co. Ltd., of Granville, N.S.W., Australia. Other companies associated in the formation of the South African venture are the Budd Company of Philadelphia, and the British firm of Leyland Motors Limited.

Enterprise Rewarded

As recorded in our January 30 issue, a further contract has been placed by the South African Railways & Harbours Administration for the building and supply of 322 all-steel main-line passenger coaches to the value of some £5,000,000 by the Union Carriage & Wagon Co. (Pty.) Ltd. The company also is a licensed builder of General Motors diesel-electric locomotives and Budd stainless-steel passenger coaches and diesel rail-cars.

DIESEL SERVICES TO CLYDE COAST AND STRANRAER.—Diesel trains are to replace steam on the Glasgow-Ayr line of British Railways, Scottish Region, this autumn. The service will be worked by "inter-city" type sets. A new morning diesel train at 8 a.m. from Ayr, serving Prestwick, Troon, and Paisley will reach Glasgow in 54 min. The 5.10 p.m. diesel train from Glasgow will call additionally at Troon and Prestwick and complete the journey in 50 min. A start will be made on the Glasgow-Largs route by using six diesel trains on Mondays to Fridays and four on Saturdays, Diesel trains will be introduced on the Glasgow-Stranraer service, working the "Irishman" the boat train connecting with the Stranraer-Larne sailings.

Interior of carriage shop as completed only six months after building site was acquired

Aerial view of site with construction work in progress, showing new rail link and gantry for steel storage yard in background

Track Recording on the South African Railways

Detecting track defects and irregularities with rail-mounted recording equipment

Track recording trolley, showing recording bogies in front and behind

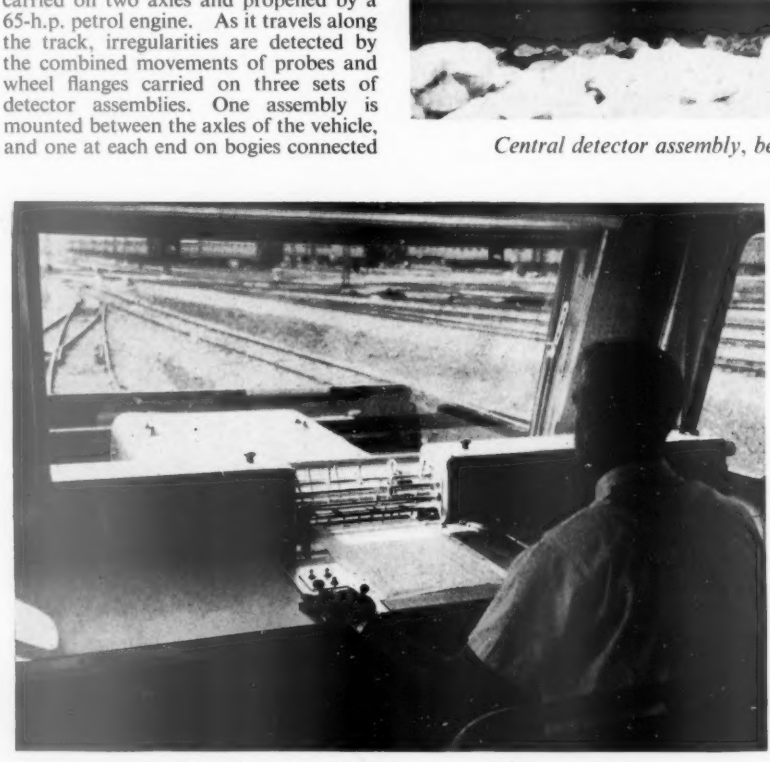
MECHANISATION of track maintenance on the South African Railways has taken another forward step with the acquisition of four self-propelled track-recording trolleys. The machines, which cost about £15,000 each, are equipped for detecting and recording defects in the track. They enable irregularities to be pin-pointed to within three to four sleepers. The trolley can operate in either direction. It is staffed by a driver and an operator, but can also accommodate inspection staff.

The vehicle is of simple construction, carried on two axles and propelled by a 65-h.p. petrol engine. As it travels along the track, irregularities are detected by the combined movements of probes and wheel flanges carried on three sets of detector assemblies. One assembly is mounted between the axles of the vehicle, and one at each end on bogies connected by outriggers. When surveying a track, the vehicle is driven at a speed of up to 19 m.p.h. but when travelling at higher speeds between working points, the outrigger assemblies are swung back and supported on the main body of the trolley and the detector assemblies are secured underneath the vehicle.

The detector assemblies are connected through wire cables and mechanical linkages to a series of pens on a recording instrument in the vehicle. This instrument continuously records the geometry of the track in graph form on a roll of transparent paper, the speed of movement of which is related to the speed of the trolley.

The function of the trolley is to record high and low points on both rails, versines (curvature) of both rails, super-elevation or cant of the track, twist or skew, gauge variations, recording speed, and mileage. The record of the curvature of each rail independently shows up poor alignment on straight track and irregular curvature on curved track. As the vehicle passes salient features at the side of the track which can be used for identification purposes, the recorder operator presses a button to indicate their position on the graph.

Central detector assembly, between axles, in working position



Interior of trolley, showing recording panel

The measurements of the high and low points on each rail are a dependent variable of the vertical displacement of the detector wheel of one of the axles on the car in relation to a reference plane formed by the two auxiliary trolleys. The radii of curves are shown by the continuous recording of the versines measured over a chord of 10 m. This 10 m. is the distance between the feeler wheels of the outrigger trolleys at each end of the vehicle, and the versine is measured by the detector assembly in the centre of the recording car.

The machines were supplied by Matisa Equipment Limited and are the first of eir kind in use on the S.A.R.

RAILWAY NEWS SECTION

PERSONAL

Mr. P. C. Neogi, Chief Engineer, South Eastern Railway of India, has been appointed the first Director-General of the Research Design & Standardisation Organisation of the Indian Ministry of Railways.

Mr. Stanley J. Adams, who, as recorded in our May 22 issue is retiring, on June 30, from the chairmanship of Thos. Cook & Son Ltd., and of the Pullman Car Co. Ltd., was born in March, 1893. Mr. Adams was educated privately and in Paris, and trained originally as a lawyer. He later took up journalism and, in 1913, worked on the "*Evening Standard*". He served throughout the 1914-18 war with the Royal Fusiliers. He joined the board of Thos. Cook & Son Ltd., in 1928, was appointed Managing Director in December, 1930, and Chairman eight years later. During the 1939-45 war, when all tourist traffic ceased, the company handled mail between various belligerent countries, and operated a Parcels for the Troops Service. Mr. Adams played an important part in these activities. During 1941-42 he was Managing Director of the Prisoners of War Department of the British Red Cross Society. After the war, the company was segregated, under the Custodian of Enemy Property, from the International Sleeping Car Company. Mr. Adams is Chairman of British Holiday Estates Limited, Dean & Dawson Limited, International Motor-coach Tours Limited Thos. Cook & Son (Bankers) Limited, and of subsidiaries in Australia, Egypt, South Africa, South America, and of Thos. Cook (Continental & Overseas) Limited. His directorships include the Midland Bank Limited, Midland Bank Executor & Trustee Co. Ltd., H.P. Sauce Limited, Lea & Perrins Inc., and Norfolk Canneries Limited.

Mr. Cecil Garstang, Chief Assistant General Manager Thos. Cook & Son Ltd., has been appointed to the board of International Motor coach Tours Limited. Mr. Arthur Turner, Assistant General Manager (Administration) has joined the boards of Hernu, Peron & Stockwell Limited, and England's & Perrott's Limited.

Mr. G. W. Quick Smith, a full-time member of the Board of Management, British Road Services, has been appointed a member of the General Staff at the Headquarters of the Commission, as of Adviser (Special Projects).

Following his retirement as Managing Director of Thomas Tilling Limited, in 1957, Mr. J. A. Falconer now wishes to resign as a director. At the request of the board, he has agreed to act as a consultant.

Mr. E. A. Talbot, District Motive Power Superintendent, Saltley, London Midland Region, British Railways, has been appointed District Motive Power Superintendent, Birmingham, New Street.

Mr. T. R. Williams, Chairman of the Public Transport Association, has retired. He is succeeded by Mr. A. F. R. Carling. Mr. R. E. Chisnell and Mr. R. J. Ellery become Vice-Chairmen for the ensuing year.

We regret that, because of a printer's error, the name of Mr. T. Lowe, who has been appointed Staff Assistant, Chief Mechanical & Electrical Engineer's Department, Derby, was given last week as Mr. T. Lower.

Mr. S. J. Adams
Chairman Thos. Cook & Co Ltd
1938 – 59

INSTITUTE OF TRANSPORT

The election of Mr. R. G. Grout Chairman & Managing Director, the General Steam Navigation Co. Ltd., as President of the Institute of Transport from October 1, was recorded in our March 27 issue. The following officers also have been elected :

Vice-Presidents

A. F. R. Carling, Executive, British Electric Traction Co. Ltd.

H. H. Crow, Chairman & Managing Director, Crow Carrying Co. Ltd.

Lord Douglas of Kirtleside, Chairman, British European Airways.

K. W. C. Grand, Member, British Transport Commission.

General Sir Brian Robertson, Chairman, British Transport Commission.

G. F. Sinclair, Member of the Management Board, British Road Services.

Hon. Treasurer

F. C. Asgill, Vice-Chairman, Stephenson Clarke Limited.

Hon. Librarian

Major-General Sir Reginald Kerr, General Manager, British Waterways.

A memorial service to the late Sir Archibald Boyd, Chairman of the Metropolitan-Cammell Carriage & Wagon Co. Ltd., will be held at 12 noon on Wednesday, June 10, at St. Margarets, Westminster.

Lord Chandos writes in "*The Times*" of May 19, 1959:—

Archie Boyd had the typical English virtues. He gave no thought to his personal prestige, and acted solely in the interests of the team or the company, without regard to himself. He was a fastidious judge of men and abhorred both the verbose and the pompous. His striking blue eyes looked quizzically at those who put a higher value on their services or their position than Archie or others would have.

In all matters no one more reliable could have been found. He was a natural games player, with a good eye, and played cricket and golf with distinction. He was fond of shooting and was an excellent fisherman. He was therefore an ideal partner either at work or play.

As a business man he impressed upon the great organisation of which he was the head that happy combination of bold enterprise, coupled with shrewdness and caution when it was necessary. He had an expert knowledge of the steel industry, which he gained from having spent a long time as a pupil in the various departments of Cammell Laird. He had a wide outlook on international business, and he and his company carried out great transactions in many parts of the world.

In short, there is no one whom I think could be more readily chosen as a typical Englishman. No one would ever have had the slightest fear that he would either say or do anything which fell below the high standards to be expected from a representative of Great Britain.

Sir John Elliot has been elected Chairman from July 1 of Willing & Co., Ltd., the parent company of the Willing group of companies engaged in industrial research, marketing and advertising. The group has for many years been a prominent user of outdoor advertising on British Railways and on the Underground.

Mr. V. Nadarajah, Civil Engineers' Department, Malayan Railways, has been elected an Associate Member of the Institution of Civil Engineers.

Mr. Cyril Wayne, General Manager, Tasmanian Government Railways, has been appointed Commissioner, Western Australian Government Railways. He succeeds Mr. T. Marsland, who will retire at the end of July.

Mr. Alastair MacLeod has been appointed a Member of the Eastern Area Board, British Transport Commission. Mr. MacLeod is a Director of Dorman Long & Co. Ltd., Steetley Co. Ltd., the North Yorkshire Shipping Co. Ltd., and Chairman of the United Kingdom Ferro-Manganese Co. Ltd. He will fill a vacancy caused by the retirement, for health reasons, of Sir Edmund Bacon.

Mr. Charles Holt
Appointed Managing Director of Thos. Cook & Co., Ltd.

Mr. W. E. G. Hewings
Appointed Works Officer of the London Transport Executive

Mr. J. J. C. Barker-Wyatt
Appointed Locomotive Works Manager, Gorton, L.M. Region

Mr. Charles Holt, Director & General Manager of Thos. Cook & Co. Ltd., who, as recorded in our May 22 issue, has been appointed Managing Director from July 1, was born in September, 1899. Mr. Holt joined the company in 1919, at the age of 20, after serving in the 1914-18 war. His first appointment was in the Rates Department and within a few months, he was posted to Interlaken and then Naples, Lucerne and Geneva. At the age of 23 he became Branch Manager at Luxor, working there during the winter, and in Stresa during the summer. On returning to England in 1926, he opened the company's Sloane Street office, later taking over the City office and becoming Joint Traffic Manager in 1940. In this position he made it his business to know every member of the staff in the British Isles, visiting each office. His next appointment was that of Traffic Manager for the British Isles, and, in 1948, he was appointed Assistant General Manager (Administration). Eight months later he was appointed Deputy General Manager, a position he held until December, 1956, when he became General Manager. He joined the board of directors last year. Mr. Holt was, for eight successive years, until July 1957, Chairman of the Creative Tourists' Agents Conference. He is a director of nine subsidiary companies of Thos. Cook & Son Ltd., and of British Holiday Estates Limited, Cook's Bank Nominees Limited and International Motorcoach Tours Limited. He is Chairman of England's & Perrott's Limited, and of Hernu Peron & Stockwell Limited.

Mr. W. E. G. Hewings, LL.B., Principal Executive Assistant, Deputy Chairman's office, London Transport Executive, who, as recorded in our May 15 issue, has been appointed Works Officer, will be responsible for co-ordinating arrangements for approval and subsequent progressing of new works projects. Mr. Hewings, who is 46, joined the Underground group of companies, in the Legal & Parliamentary Office, in 1929. After serving in the offices of the Executive and of the Architect, he became Personal Assistant to the Deputy Chairman, in 1955. He became Secretary of the Executive Works Committee in 1957, and was made Principal Executive Assistant 1958. Between January and April, 1957, Mr. Hewings was seconded to the Singapore Government and, with Mr. L. G. Hawkins, visited Singapore in connection with a proposed unification of the road passenger services. In 1939, Mr. Hewings enlisted in the 84th London Transport (A.A.) Regiment, Royal Artillery, Territorial Army. He served throughout the 1939-45 war, latterly with R.E.M.E., and returned to the service of London Transport in 1945.

Mr. J. J. C. Barker - Wyatt, T.D., A.M.I.Mech.E., Assistant Locomotive Works Manager, Gorton, London Midland Region,

Mr. D. N. Macleod
Appointed General Superintendent, Eastern Region, C.P.R.

Mr D. G. Riley
Appointed Assistant Chief Civil Engineer, Malayan Railway

Mr. H. C. Swart
Appointed Catering Manager, South African Railways

British Railways, who, as recorded in our May 22 issue, has been appointed Locomotive Works Manager, Gorton, was educated at Worcester Royal Grammar School. He joined the Great Western Railway at Swindon, in 1934, as a Premium Apprentice, and was awarded the Great Western Railway Chairman's Prize. After his apprenticeship he was transferred to the Chief Mechanical Engineer's Principal Drawing Office. Mr. Barker-Wyatt was with the R.A.O.C. (Workshops), later R.E.M.E., from 1939 to 1946. He served in Burma and attained the rank of Major. He returned to the Chief Mechanical Engineer's Drawing Office, Swindon, and, in January, 1950, was appointed Assistant to Works Manager (Outdoor Machinery) at Wolverhampton Locomotive Works. In December, 1952, he was appointed Assistant to the Locomotive Works Manager, Doncaster, and promoted to be Assistant Locomotive Works Manager, Gorton, in September, 1955. Mr. Barker-Wyatt at present holds the rank of Lt.-Colonel in the Transportation Staff Pool, Royal Engineers (A.E.R.), and has served with this Corps since 1948.

Mr. D. N. Macleod, General Superintendent, Prairie & Pacific Regions, Winnipeg, Canadian Pacific Railway, who, as recorded in our May 15 issue, has been appointed General Superintendent Eastern Region, Montreal, joined the C.P.R. in 1928. Since the 1939-45 war, in which he served overseas with the Royal Canadian Corps of Signals, from 1939 to 1945, Mr. Macleod has been Equipment Engineer, Montreal; Inspector at Vancouver, 1946-50; Superintendent of Traffic, Winnipeg, 1950-51; Superintendent, Saskatchewan District at Moose Jaw, 1951-53; Superintendent, Ontario District at Toronto, 1953-54; and General Superintendent at Winnipeg from 1954 until taking up his present appointment.

Mr. D. G. Riley, A.M.I.C.E., who, as recorded in our March 20 issue, has been appointed Assistant Chief Civil Engineer, Malayan Railway, was born, in 1920, at Holyhead. Educated at the Holyhead County School, he joined the London Midland & Scottish Railway, in 1937, in the District Engineer's Office, Bangor. During the 1939-45 war Mr. Riley served with the Royal Engineers in North Africa, Italy, and Western Europe. On demobilisation he returned to the L.M.S.R. and worked in the Permanent Way and Bridge Departments at head office. He joined the Malayan Railway, as an engineer, Way & Works, in 1950. The following year he was appointed District Engineer, Gemas and, in 1954, transferred to Ipoh, in the same capacity.

Mr. H. C. Swart, Assistant Catering Manager, South African Railways, who, as recorded in our May 15 issue, has been appointed Catering Manager, joined the system in 1948 as Assistant Superintendent (Wines & Spirits). The following year he was appointed District Manager (Catering), and, in 1951, became Superintendent (Dining Car Services). He was appointed Assistant Catering Manager, the appointment he now relinquishes, in 1956.

Mr. F. J. Burge, Divisional Controller (Freight Services), Midland Division, London Midland Region, British Railways, who, as recorded in our May 22 issue, has been appointed District Operating Superintendent, Derby, London Midland Region, began his railway career on the London Midland & Scottish Railway, at Hensall, as a junior clerk. In 1939, he was appointed a traffic apprentice. In 1940 he joined the Railway Operating Division, Royal Engineers, and served in North Africa and Germany, before being demobilised, in 1946, with the rank of Major. Mr. Burge returned to Westhouses, as District Signalman's Inspector, and, in 1947, was appointed Assistant Yardmaster, Kirby-in-Ashfield. In 1948 he was appointed Assistant to the District Operating Superintendent, Gloucester, and, in 1950, to a similar position at Nottingham. Mr. Burge attended the Administration Staff College, Henley-on-Thames, before taking up the position of Assistant District Operating Superintendent, Birmingham. In 1955 he was appointed Divisional Controller (Freight Services), Midland Division, L.M.R., Derby.

We regret to record the death, on May 16, of Mr. Kenneth Brook, an executive director of C.A.V. Limited.

Mr. Joseph Fairclough, Assistant District Operating Superintendent, Liverpool, Lime Street, has been appointed District Operating Superintendent Crewe.

Mr. P. G. Gibbins, M.Inst.T., General Superintendent, Central Road Services, London Transport Executive, has retired. He joined Walthamstow Corporation Tramways in 1910. In 1926 he became Chief Assistant to the General Manager, Tramways, and four years later was made Operating Assistant. He became a district superintendent, in 1933, on the formation of the London Passenger Transport Board and, in 1935, was promoted to be Assistant Divisional Superintendent. He was made Divisional Superintendent, Trams & Trolleybuses, Southern Division, in 1941; General Superintendent, Trams & Trolley-buses, in 1948, General Superintendent, Central Road Services, in 1950.

Mr. G. E. J. Monson, A.M.I.Mech.E., A.M.Inst.T. Assistant to the Road Motor Engineer (Maintenance) London Midland Region, British Railways, who, as recorded in our May 22 issue, has been appointed Assistant Road Motor Engineer, began his career as an apprentice with the former London General Omnibus Co. Ltd., at Chiswick Works in 1927. After holding various appointments with the London Passenger Transport Board he took a special course in a number of operating branches. In 1940 Mr. Monson was appointed Deputy Technical Officer, L.P.T.B., and from 1942 to 1945 was seconded to the Ministry of Transport. In 1946 he was appointed Assistant to Road Motor Engineer, London Midland Scottish Railway, Euston, and was later designated Assistant to Road Motor Engineer (Maintenance) the appointment he now vacates.

Mr. J. A. Lacey, Docks Superintendent, Middlesbrough, British Transport Docks, has been appointed Portmaster, Grimsby & Immingham Docks, from June 1. He succeeds Mr. H. M. Mitton, who, as recorded in our March 27 issue, has been appointed Chief Administrative Officer, British Transport Docks Headquarters. Mr. J. A. Lacey joined the London & North Eastern Railway in 1934. He served in the Royal Engineers, 1939-46, becoming a Traffic Captain in a Railway Operating Company, and subsequently being appointed Staff Captain, Transportation Directorate, Burma. In 1947, he was selected for a Traffic Apprenticeship and, after training, was attached to the District Operating Superintendent's Office, Sunderland. In July, 1949, he was transferred to the Docks and Inland Waterways Executive and took up an appointment in the Traffic Section of the Chief Docks Manager's Office, Hull. In 1955, he became Dock Agent, Victoria Dock, Hull, and in 1956, Assistant to the Docks Manager, Middlesbrough & Hartlepool Docks. In January, 1958, Mr. Lacey was appointed Dock Superintendent, Middlesbrough, which position he now vacates.

Mr. W. J. Carron has been re-elected President of the Amalgamated Engineering Union for a second term.

Colonel L. Bullen has been appointed Managing Director of F. Taylor & Sons (Manchester) Limited.

Mr. George Carr, General Sales Manager, Dunlopillo Division, Dunlop Rubber Co. Ltd., has been re-elected Chairman of the British Latex Foam Manufacturers' Association for the year 1959-60.

Lord Halsbury, Vice-Chairman of Lancashire Dynamo Holdings Limited, has been appointed to the board of Lancashire Dynamo Electric Products Limited, as Chairman.

Mr. David J. Young, Steel Company of Wales Limited, and Dr. H. Mastin, British Aluminium Co. Ltd., have been elected Chairman and Vice-Chairman respectively of the South Wales Executive Committee, Industrial Association of Wales & Monmouthshire.

Mr. C. T. M. Bagnall, Publicity Manager, English Electric Co. Ltd., has been elected Chairman of the Publicity & Exhibitions Committee, British Electrical & Allied Manufacturers' Association for 1959-60. Mr. G. M. C. Peacock, Manager, Publicity Department, Babcock & Wilcox Limited becomes Vice-Chairman.

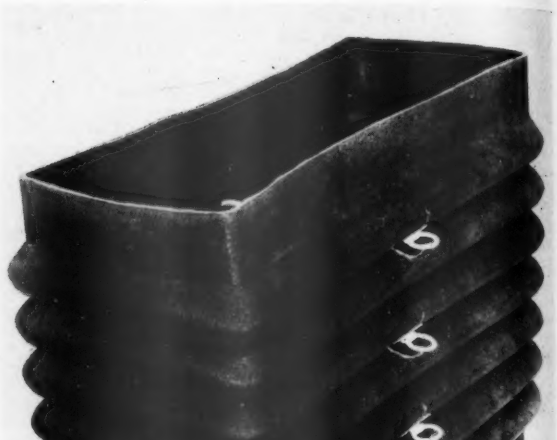
Mr. R. J. Jackson Nisbet, Director of Canadian Operations for Wolf Electric Tools Limited, arrived in this country on May 27 for a four-week business visit.

Mr. A. Wilkinson, Managing Director of the Spiral Tube & Components Co. Ltd., will retire on July 1, to become Deputy Chairman of the company. He will be succeeded by Mr. K. J. Wilkinson, at present Deputy Managing Director. Mr. A. Wilkinson joined the company in 1915 and has been Managing Director for 25 years. Mr. K. J. Wilkinson became a director ten years ago and was appointed Deputy Managing Director in 1953. He is Past-Chairman of the Derby branch of the British Institute of Management and of the Notts. & Derby branch of the Institution of Works Managers.

Dr. W. Steven, Superintendent, Development & Research Department Laboratory, Mond Nickel Co. Ltd., Birmingham, is being transferred, on June 1, to the Development & Research Division, International Nickel Co. Inc., New York, as Director of Research. He has also been elected an Assistant Vice-President of that company. Dr. Steven will be succeeded by Mr. G. L. J. Bailey, Superintendent, Platinium Metals Research Laboratory, Development & Research Department, Acton. Dr. W. Betteridge, Development Officer, London, succeeds Mr. Bailey.

Sir Josiah Eccles, Deputy Chairman of the Electricity Council, has been appointed President of the Electrical Development Association for 1959-60. Mr. A. W. Ferguson formerly Chief Administrative Officer, Electricity Board for Northern Ireland, and Mr. John Mould, formerly Chairman, East Midlands Electricity Board, have been appointed Vice-Presidents for the term 1959-1962. At the first meeting of the Association's newly-constituted Council, Mr. T. E. Daniel, Chairman, North Western Electricity Board, was elected Chairman for 1959-60, and Mr. D. B. Irving, Chairman of the London Electricity Board, was elected Vice-Chairman.

NEW EQUIPMENT AND PROCESSES



Synthetic Rubber Bellows for Ventilating Traction Motors

TRACTION motor ventilating bellows are now available in rectangular and circular form from specially-compounded oil- and heat-resisting rubber containing a high proportion of synthetic rubber.

The bellows are reinforced with square-woven fabric, bias cut, and covered externally with cotton stockinette impregnated with rubber. The various laminations are moulded into a tough, homogeneous material which is unaffected by oil and heat and retains its resiliency.

Rectangular bellows can be supplied with cross-ties of Terylene cord with plastic rings. Both types can be made to customers' requirements.

Further details can be obtained from the John Bull Rubber Co. Ltd., Industrial Sales Division, Leicester.

Shadowfree Work Light

AN addition has been made to the "Allen" A.103 series of work lights, which are portable, adjustable, and specially designed for use in cramped and awkward situations.

The new model, the A.103/G, is for use in garages and vehicle workshops. A 2 ft. 20W. fluorescent tube is contained in a sealed "Perspex" cylinder housed in a heavy-gauge steel reflector. This is attached by an adjustable joint to a hollow-cast aluminium base containing the control gear. The lamp can be positioned to throw light in any direction. It can be used in, under, on or by the side of vehicles, is without heat and glare and casts virtually no shadows. This new design meets the requirements of the L.C.C. under the Petroleum (Regulations) Acts 1928 and 1936.

Construction is robust—the reflector is of heavy-gauge steel, cast case in aluminium. The whole unit is sealed and the cable is oilproof. With a tube life of 5,000 hr. and a consumption of only 20W., running costs are negligible. Standard models are for 200/250V. 50-cycle a.c. supply, but lights are available for non-standard voltages and frequencies.

Price is £23 (including tube) and delivery is approximately three weeks.

Further information can be obtained from the manufacturer, P. W. Allen & Company, 253, Liverpool Road, London, N.1.

Industrial Television

THE Epsylon industrial television system has been designed with small size, convenience, and reliability as the outstanding considerations, yet the clarity of definition is equal to that used by the leading national broadcast companies. Among its many suggested applications are: the conveyance of mass information simultaneously to several points in railway stations, the view of approaching vehicles in traffic control, and visual instruction in technical classes.

Advantages are that the camera can be

placed close to the apparatus under observation and can relay information to a point at a safe distance; the camera can be placed in positions unsafe or too small for a man; the remote image can be viewed by many, instead of only one observer; several cameras can be installed and the remote observation monitor can switch from one to another instantaneously; several remote monitoring points can be provided.

Camera errors are not greater than ±1 per cent. Stability is high: a variation in mains supply voltage up to ±10 per cent has negligible effect on its image. External light changes of over 50:1 are automatically compensated. Added accessories to the basic camera enable the equipment to be used as a programming camera.

The viewfinder is an 8-in. diagonal monitor mounted on a tripod. The monitor consists of a viewing unit and power supply, the latter being mounted between the tripod lens. The equipment will work with or without waveforms from a standard synchronising generator. In its "free" condition the field time bases are locked to the mains frequency while the line frequency is completely random, ensuring a running-through system which is difficult to distinguish from an interlaced system.

The camera is fully-automatic, and all d.c. supplies are stabilised to eliminate effects of supply variation. Automatic control of signal levels for changes of light level and remote control of electrical functions minimise the need for camera cable runs. Normal cable length is 50 ft.

The camera control unit, designed for 19-in. rack mounting, also can be housed in an industrial steel box. The unit consists of five plug-in sub-units covering video, line scan, field scan, stabilisation, and power and control. Each has a failure lamp to indicate fault. Switching on front panels makes possible positive/negative picture switching, internal/external synchronisation, field scan reversal, automatic/manual signal level control, and mains on/off. Input/output connections are at the rear of the unit.

An external synchronising waveform may be inserted to produce 2:1 interlaced scans and synchronising operation of any number of channels.. In multi-channel operation any one channel may be used to synchronise the remainder. Full protection circuits eliminate damage to the pick-up tube.

Power supply is 95-250V a.c., 50- or 60-cycle 200VA. Temperature range is from —30 deg. C. to 50 deg. C.; humidity, from zero to 100 per cent. Dimensions are as follow. Camera head (less lenses): height, 4 13/16 in.; depth, 8⅜ in.; width, 4 21/32 in.; weight approximately 6 lb. Camera control unit (rack version): height, 14 in.; depth, 9½ in.; width, 19 in.; weight, approximately 46 lb. Camera control unit (case version): height, 16⅛ in.; depth, 10½ in.; width, 21½ in.; weight, approximately 75 lb. The 8-in. monitor is built with separate power supply to allow the minimum size viewing unit.

Further details can be obtained from the manufacturer, Epsylon Industries Limited, Faggs Road, Feltham, Middlesex.

22½-ton Truck Crane

THE M.E.I. truck crane has been introduced to meet the U.S.A. 25-ton lifting capacity ratings. Maximum lifting capacity on British ratings is 22½ tons at 10-ft. rad. with 30-ft. basic boom, and 4.7 tons at 25-ft. rad. with maximum length of main boom (100 ft.).

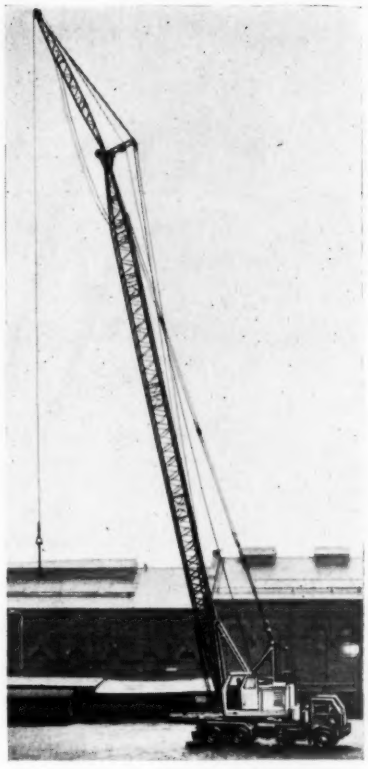
The truck is a six-wheel special "Foden" unit with heavy-duty chassis frame. Overall width is 8 ft.

The carrier incorporates outriggers with screw jacks extensible to 13-ft. centres. Outriggers have been designed to eliminate deflection.

Power for traction and hoisting is by Gardner engines. Transmission is by single-plate clutch and five or eight-speed gearbox. Brakes are air-pressure-operated and the electrical system is 24v. The rear bogie is mounted on rocking beams with compensation for individual axle movement. Both rear axles are driven. A central trough in the cab allows the boom to be carried in a forward position for travelling.

The revolving superstructure rotates on a large-diameter live ring with 20 rollers, the tilting forces being taken by three adjustable hook rollers. Separate clutches and brakes govern each motion. Cover for all machinery is low-built and driver's cab gives 360 deg. vision. Windows fold back into the roof and removable panels give access to machinery. The structure frame folds down for low headroom yet is sufficiently high in the working position for the 100-ft. main boom to be lifted without assistance.

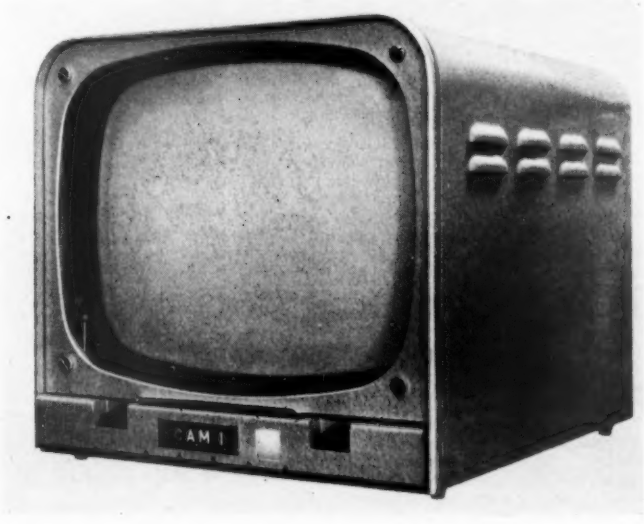
The 30-ft. crane boom is in two sections with pin-joints, and 10-ft. and 20-ft. pin-jointed lengthening sections are available to a maximum length of 100 ft. The semi-hammer-head construction of the boom head simplifies the multi-strand rope reeving and improves the clearance between boom and



load especially at minimum radius. Boom suspension ropes are reeved on a bridle so that lengthening sections can be added to suspension rope and boom simultaneously. A tubular fly jib also is available with a basic length of 20 ft. jointed in the centre for insertion of lengthening sections. The crane boom is fitted with devices to speed up boom-length changing.

Additional equipment is available to convert the machine for duty as a two-line grabbing crane, piledriver, face shovel, backhoe and dragline. Capacity of digging attachments is 3/4 cu. yd.

Further information can be obtained from the manufacturer, Thomas Smith & Sons (Rodley) Ltd., Rodley, Leeds.



Inauguration of Widening at Potters Bar

Completion of four tracks between Greenwood and Potters Bar and three double-line tunnels

South portals of Hadley North Tunnels, showing completed new tunnel

Sir Brian Robertson, Chairman of the British Transport Commission, unveiled a commemorative tablet at Hadley Wood Station, British Railways, Eastern Region, on May 20, to mark the completion, after four years, of work to widen the line, provide four tracks instead of two over a distance of some 2¼ miles between Greenwood and Potters Bar, and the construction of three double line tunnels respectively 384 yd., 232 yd., and 1,214 yd. in length.

At the opening ceremony, presided over by Sir Reginald Wilson, Chairman of the Eastern Area Board, Sir Brian Robertson congratulated all those concerned with the project. In particular, he paid tribute to Sir William Halcrow & Partners, the consulting engineers responsible for the tunnel design, and for supervision of the main contract; Charles Brand & Sons Ltd., the main contractors for the civil engineering work; Henry Boot & Sons Ltd., the sub-contractors for track laying; Kyle, Stewart (Contractors) Limited, the contractors for the reconstruction of Hadley Wood Station; and Mr. A. K. Terris, Chief Civil Engineer, Eastern Region, under whose direction the whole of the civil engineering works were carried out. He also referred to other essential works carried out as part of the scheme such as design of station buildings, under the direction of Mr. H. H. Powell, Regional Architect; signalling work carried out by Metropolitan-Vickers-G.R.S. Limited, under the direction of Mr. R. A. Green, Signal Engineer; and electrical work under the direction of Mr. K. J. Cook, Chief Mechanical & Electrical Engineer.

Reconstruction Work

The bottleneck created by having only two tracks on the East Coast main line at a point so close to the London terminus would, long ago, gravely have impeded main line services had it not been for an alternative though slightly longer route to the North, known as the Hertford loop line.

Modernisation of the East Coast main line to provide for improved services demanded a better long-term solution than was provided by the Hertford loop line and in 1955 a start was made on quadrupling the line, thus providing not less than four tracks continuously between Kings Cross and the Welwyn Viaduct, a distance of some 21 miles.

For economic and other reasons, tunnelling techniques had to be considered totally different from those formerly employed. It was decided that a concrete lining to the new tunnels would be the most suitable and economical. It was necessary, however, to ensure that there would be no adverse effect on the concrete lining due to the passage of steam locomotives. Use was made, therefore, of "Sealithor" metallurgical supersulphated cement in the manufacture of the precast concrete units above ballast level. The construction of the tunnels was described in our issue of February 14, 1958.

Rearrangement of Lines

Laying of track was carried out by contract except for a length at each end completed during the final staging period. Successive week-end engineering possessions resulted in a rearrangement of the tracks so that what formerly were the two main lines traversing the old tunnels became the up fast and up slow lines and the down fast and down slow tracks were routed through the new tunnels. Apart from Potters Bar station, which was opened in 1955, reconstruction has been carried out at Hadley Wood Station. Platforms have been provided to serve all four tracks, the centre tracks being the fast lines and the outer pair the slow lines. The station buildings at road level are situated on an overbridge and comprise a ticket office, booking hall, and cycle store. Whilst the original structure has been retained, the interior has been modernised and the exterior repainted.

Colour-light signalling has been installed between New Barnet North signalbox and Potters Bar. The former Greenwood signalbox which previously controlled the converging point from four tracks to two, north of New Barnet, has been demolished. Between New Barnet and the north portal of Potters Bar tunnel, which has constituted the resignalling under the recently completed works, 19 new signals are of the searchlight type designed to conform to the general pattern of colour-light resignalling of the Great Northern main line.

Completion of Long-Planned Scheme

Sir Brian Robertson, speaking at a luncheon in London after the opening ceremony, recalled that the tunnels and new lines on the New Barnet to Potters Bar section which had been seen during the morning represented the culmination of a project which had been under discussion for very many years. The project itself had formed part of the modernisation plan which had been approved by the Railway Executive when Sir John Elliot was its Chairman, and he was particularly pleased also to see present two other members of the Executive of that time—Sir Michael Barrington-Ward and Sir J. Landale Train, both of whom had been former officers of the old London & North Eastern Railway.

The cost of the scheme would be some £2¾ million and the expenditure of that money was not going to bring in any direct dividend in the immediate future. It had been spent as part of the modernisation plan which was going on to make the Eastern and North Eastern Regions a great artery fit for modern conditions of travel and traffic. Work was also going on at Peterborough and Grantham which should eliminate the speed restrictions in those areas. These were just parts of the whole plan to improve British Railways.

Even with the new lines which had been laid-in on the sector to New Barnet, the Welwyn viaduct would remain as a bottle-

Sir Brian Robertson unveiling a wall plaque at Hadley Wood Station commemorating the opening of new lines and tunnels

neck but this was not really so serious because not so many trains used it as the lines nearer the terminus. The signal engineers might very well be able to give assistance in working traffic over the viaduct. It was clear that King's Cross would have to be rebuilt, as the terminus was one of the most difficult of all to operate.

Off-peak Travel Concessions

The new works would make it a great deal easier for the Eastern Region to deal with local traffic. Season ticket holders in particular could certainly look forward to better conditions as a result of these works.

Sir Brian Robertson then referred to talks of increases in fares and added that the British Transport Commission was not going to put a steep surcharge on season ticket holders who travelled in the peak periods, at any rate, at the present time. What it would do would be to encourage off-peak travel by making substantial concessions in fares for travel outside the busiest period.

He concluded by saying that the Eastern Region modernisation work was a showpiece for British civil engineering. They had done an excellent job in the difficult art of making tunnels. It was good to see them put their goods in the shop window and he hoped that the display would lead to many good orders to the British civil engineering industry from many parts of the world.

BRITISH TRANSPORT COMMISSION
ON 20TH MAY 1959 SIR BRIAN ROBERTSON, CHAIRMAN
OF THE BRITISH TRANSPORT COMMISSION, FORMALLY
OPENED THE WORKS WHICH COMPLETED THE QUADRUPLING
OF THE GREAT NORTHERN LINE FROM WELWYN VIADUCT
INTO LONDON – A DISTANCE OF 21¼ MILES
THESE WORKS INVOLVED THE PROVISION OF TWO
ADDITIONAL TRACKS FOR 2¼ MILES, THREE DOUBLE LINE
TUNNELS TOTALLING 1830 YARDS IN LENGTH, AND
THE REBUILDING OF THE STATIONS AT POTTERS BAR
AND HADLEY WOOD
ENGINEER
A.K. TERRIS ESQ. M.I.C.E.
CONSULTING ENGINEERS
SIR WILLIAM HALCROW AND PARTNERS

The wall plaque at Hadley Wood commemorating completion of the new works

I.R.S.E. Summer Convention in Italy

Visits to signalling installations at Treviglio and Bologna

THE summer convention of the Institution of Railway Signal Engineers was held in Italy on May 14-18, by the courtesy of the Italian State Railways. Most of the party, numbering 185, left London on May 13, led by the President, Mr. D. G. Shipp, supported by Mr. W. Owen and Mr. F. G. Hathaway, Vice-Presidents; Messrs. J. H. Fraser, F. L. Castle, E. G. Brentnall, R. Dell, A. W. Woodbridge, J. C. Kubale, J. F. H. Tyler and T. S. Lascelles, Past-Presidents; several Members of Council; Mr. R. L. Weedon, Hon. General Secretary; Mr. V. H. Smith, Hon. Secretary, General Purposes Committee; and Mr. B. Reynolds, Hon. Treasurer for the Convention. The two last were responsible for completing the arrangements of the visit.

On arrival in Milan on May 14, where members from Sweden, Holland, Switzerland, and Germany joined those coming from England, the party was welcomed on behalf of the Italian State Railways by Mr. Mario Forte, Divisional Manager, Milan, and Mr. F. Tolotti, Chief Signal Engineer; and on behalf of the Compagnia Italiana Westinghouse, which was extending considerable hospitality to the visitors, by the Managing Director, Mr. G. Cini, accompanied by members of their staffs.

Relay Interlocking Box at Treviglio

Members then travelled by special train to Treviglio, where Mr. Tolotti gave an address. He described the main features of the latest signalling practice observed in Italy and the reasons for following certain principles, the application of which would be seen in the installations to be inspected. He also gave some historical information. Booklets were distributed giving general descriptions of the equipment. The Westinghouse Company provided copies of the articles in *The Railway Gazette* of March 27, 1953, and April 27, 1956, containing additional information, and of a work commemorating the golden jubilee of the company's undertaking, which fell in 1956.

The party visited the new push-button type relay interlocking signalbox and inspected the relay rooms, point machines, and other equipment, including the latest types of standardised relays.

From Treviglio members went on to Pioltello to examine an hydraulic power signalbox. The system dates back to 1886 and even today there are 8,500 levers at work. At Pioltello, double-acting point mechanisms were seen, an improvement on the original differential piston system of actuation. The hydraulic boxes are being modernised by the application, as seen at this station, of colour-light signals, with constant detection, track circuit controls, and similar refinements. The return to Milan was by special train direct.

Remote Control at Bologna

On May 15 the party continued to Bologna, where it was received by Mr. R. Alessandri, Divisional Manager, Bologna, who gave some information on the traffic dealt with at that centre. Mr. Tolotti explained the arrangement of the signalling in the station area and the remote control of the 11 surrounding junctions, spread over some 50 route miles, with complex through connections for freight movements between the marshalling yard of S. Donato and certain goods stations. Six main lines converge on this layout.

Visits were made to the two main signalboxes. with traffic controllers' offices, local and regional, and some outlying junctions, where the apparatus is housed in what had been intended to be ordinary signalboxes. These now have local emergency operating panels. Manual operation of points, resorted to in case of failure, was demonstrated. They also saw a set of electrically-operated half-barriers at a level crossing combined with bells and flashing lights. Members and ladies then made a coach tour of the city.

On May 16 the entire party made a tour by coach and motorship to the principal points of interest on Lake Maggiore. It was entertained to luncheon on board by the Italian Westinghouse Company.

In the evening the Institution dinner was held at the Hotel Excelsior Gallia, Milan. Mr. D. G. Shipp took the chair. The principal guests were Messrs. Mario Forte, F. Tolotti, Rigo Righi, Principal Assistant, Electrical Department, Italian State Railways; and Mr. G. Cini.

Mr. Shipp, after offering the toast of the President of the Italian Republic and Queen Elizabeth II, expressed thanks for the welcome extended to the Institution and the facilities and hospitality granted to the party by the management of the State Railways and the Westinghouse Company. He thanked also the many engineers concerned with the technical inspections they had been privileged to make. They felt much admiration for the progressive spirit, in evidence from early years, seen in signal engineering in Italy, leading up to the equipment inspected during the visit, also for the other examples of up-to-date railway plant, and notably the comfortable and quick electric trains.

Mr. M. Forte, acknowledging the toast, expressed the regret of the General Manager of the State Railways, Mr. S. Rissone, at being unable to attend, and emphasised the value of interchange visits between engineers in the various countries. As the Institution had visited installations in several countries before coming to Italy, he pointed out, the opinions of its members on the installations in Italy would be very valuable to those responsible for them. In both Britain and Italy great efforts were being made to modernise the railways, and such meetings encouraged them all to believe in their future and continue the work on which they had been so long engaged.

Mr. G. Cini expressed the regret of the President of the Italian Westinghouse Company, Mr. Mario Marconi, at being unable to be present and assured members of the pleasure it gave them to be able to extend hospitality.

Mr. W. Owen, Senior Vice-President, thanked Mr. V. H. Smith and Mr. B. Reynolds and their ladies, with other helpers, for the great amount of work they had done, over a considerable period in making the arrangements for the convention.

On May 17, the party travelled to and from Venice by a special multiple-unit

express train. Dinner was offered by the State Railways.

On the following day they travelled to Turin, where a tour of the Fiat motor works was made. They were received by a number of engineers, acting for Dr. G. Bono, Managing Director of the Fiat Company.

By courtesy of the Italian Westinghouse Company, a motorcoach tour was made of the city. The company entertained the party before its departure for London that evening. Mr. Mario Marconi presided, supported by Mr. G. Cini, and other officers, and by Mr. M. W. Shorter, Managing Director, Westinghouse Brake & Signal Co. Ltd., London.

Railway Benevolent Institution

The annual meeting of members of the Railway Benevolent Institution will be held at Euston Station, London, N.W.1, on June 30, at 4 p.m. The business will be: (*a*) To receive the report of the Board of Management; (*b*) to approve an amendment to Bye-law 20, to become operative from August 16, 1959; (*c*) to approve an amendment to Bye-law 48; and (*d*) to transact the ordinary business of the Institution.

The proposed amendment to Bye-law 20 is as follows: "The amount of an annuity, whether payable to a railwayman or his widow shall in general, subject to a maximum of £25 (or in the case of a person qualified in the Officers' Department under the old Rules £32 10s. provided he has paid 26 consecutive annual contributions) be fixed at the rate of £1 5s. for each year of qualified membership of the railwayman provided the qualified membership exceeds five years; his widow shall be eligible whether or not the railway man was awarded an annuity. In the case of a railwayman with less than five years' qualified membership who or whose widow applies for assistance the Board may award gratuities at their discretion."

The proposed amendment to Bye-law 48 reads: "A fund shall be established called the Special Benevolent Fund, and for this purpose the Board of Management shall have discretion to take such sums as they may consider appropriate from the donations contributed to the Institution."

Torque Converter Convention

With the aid of films and a series of lectures, an overall survey of all torque converter applications was recently presented to users and prospective users of this equipment at a two-day convention held in London.

Sponsored by British Twin Disc Limited, the convention was attended by over 100 technical executives of firms concerned with the manufacture of diesel railcars, shunters maines locomotives, earth movers, cranes, and similar equipment. The main lectures dealing with torque converter theory and design were given by Mr. J. B. Schubeler, of the parent company, the Twin Disc Clutch Company, U.S.A. Converter selection for each type of application in the U.S.A. and Canada was reviewed by Mr. H. J. Wirry, also of Twin Disc, U.S.A. This was followed by a review of British practice by Mr. R. Hill, of British Twin Disc, and of continental practice by M. Yves van Delft, of Brussels.

Railcar torque converter applications made by Rolls-Royce Limited were reviewed by Mr. Ralph Leaver, of Rolls-Royce Limited, Crewe. These incorporate a free-wheel for coasting, and a torsionally flexible propeller shaft to provide a cushioned direct drive. The control equipment fitted is arranged to allow multiple-unit trains to be made up of power cars fitted with torque converter and mechanical gearbox transmissions.

Shunting Locomotives

Reference was made during the discussion of converter applications for shunters to the relatively high heat rejection when running on light loads. This, it was stated, occurred with the three-stage converter when running at top speed in the low efficiency range of the curve. The remedy adopted to deal with this problem was the fitting of an output shaft speed governor. This takes the form of an auxiliary pump working in conjunction with the hydraulic governor on the fuel pump. Development was also proceeding with the use of single-stage converters for shunter applications.

In the overall field of torque converter applications there is now a multiple of types, incorporating clutches and free wheels in a variety of combinations, each designed to produce characteristics suitable for specific applications. With the range of refinements available, the modern torque converter is superior in a number of ways to other forms of transmission, but expert guidance and knowledge is required in the selection of the type required for each application.

The British Twin Disc Company now has in production at Rochester, Kent, the Type 1 and 6 single-stage converters and a variety of other power transmission equipment, all produced under licence from the parent company. Three-stage converters are produced for British Twin Disc on a sub-contract basis by Rolls-Royce Limited, which also holds a direct licence from the Twin Disc Clutch Company, U.S.A., for the manufacture of torque converters fitted to Rolls-Royce engines.

Permanent Way Institution 75th Anniversary Convention

The programme of the 1959 Convention of the Permanent Way Institution which is to be held in London on June 6-11, and marks the 75th anniversary of the Institution, includes events and visits as detailed below.

June 6 : A meeting of the Council of the Institution will be held at 2.30 p.m. at the Institution of Civil Engineers, Great George Street, S.W.1. In the evening London Transport Executive will give a reception and dance at the Porchester Hall, Bayswater, W.2.

June 7 : A thanksgiving service to commemorate successful conclusion of 75 years' work by the Institution will be held at St. Pancras Church, Euston Road at 11 a.m. The address will be given by the Reverend Ronald Scruby, a former member of the technical staff of the Permanent Way Department, L.T.E.

June 9 : The annual summer general meeting will be held at 10 a.m. at the Institution of Civil Engineers. At the conclusion of business a paper, "Wheels and Rails" will be given by Mr. T. M. Herbert, Director of Research (British Railways) and Chairman of the Joint Vehicle & Track Committee.

In the afternoon at 2.30, the President, Mr. C. E. Dunton, and Members of the Council will hold a reception at the Stationers' Hall, Ludgate Hill. The principal guest will be the Lord Mayor of London, who will be accompanied by the Sheriffs and the Worshipful Master and Wardens of the Stationers' & Newspaper Makers' Company. The Annual Summer Dinner will be held in the Connaught Rooms, W.C.2, at 7.30 p.m. Sir Brian Robertson, Chairman of the B.T.C., will be the principal guest.

Technical visits will include the following:

June 8 : Ford Motor Company works at Dagenham (a.m.); London and Tilbury Docks (a.m.), when the party will be entertained to luncheon by the Port of London Authority (all day); Southern Region Kent Coast electrification work between London and Ramsgate (all day); L.T.E. Lillie Bridge Depot (p.m.); Post Office Railway (p.m.).

June 10 : Henry Williams Limited, Signalling Department, Rickmansworth (a.m.); eletrification and associated works on Eastern Region lines between London and Clacton (all day); cruise through Port of London (p.m.); L.T.E. night maintained railways (night visit commencing 11.15 p.m.).

June 11 : L.T.E. Lillie Bridge Engineer Depot (a.m.).

Staff and Labour Matters

N.U.R. Withdrawal from Railway Consultative Machinery

The National Union of Railwaymen, which has decided to withdraw from joint consultation with the British Transport Commission from June 30, has been told by Sir Brian Robertson that the Commission will continue to do its best to consult the elected representatives of the staff on plans for the future of British Railways.

Sir Brian Robertson has written to Mr. S. F. Greene, Secretary of the N.U.R., to say that he has noted with regret the executive committee's decision to withdraw in spite of the fact that "this is a clear breach of the agreement between us." The text of this letter is given below, together with the text of Mr. Greene's letter to which it is a reply:—

222, Marylebone Road,
London, N.W.1
May 22, 1959

"Dear Mr. Greene,

I acknowledge receipt of your letter of May 7. I note with regret the decision of your Executive Committee to withdraw your union from joint consultation after June 30, despite the fact that this is a clear breach of the agreement between us.

The Commission will continue to do their best to consult the elected representatives of the staff on their plans for the future of British Railways. The agreed machinery of consultation will continue and the door will remain open for those representatives who are members of your union to take part in the proceedings.

I am sending copies of this correspondence to the other Trade Unions who are parties with you to the agreement of May 28, 1956.

Yours sincerely,
BRIAN H. ROBERTSON."

Unity House,
Euston Road, N.W.1
May 7, 1959

"Dear Sir Brian,

Compulsory Trade Union Membership

With reference to your letter of April 15, I have to say that this has now been considered by my executive committee who feel that the spirit of co-operation has been seriously prejudiced by the attitude of the Commission.

In view of this position my committee consider they have no option but to repeat their previous decision, and have decided to instruct all our members at Branch, Sectional Council and all other levels that they should not attend consultation meetings after June 30, 1959, and that only business appropriate to the machinery of negotiation should be transacted.

Yours sincerely,
S. F. GREENE."

It will be recalled that the N.U.R. first wrote to the Commission on March 17 to say that it had decided to withdraw from the British Railways' Productivity Council, and all stages of the consultative procedure because of dissatisfaction with the Commission's attitude to compulsory trade union membership. Sir Brian Robertson replied on March 20, expressing the Commission's astonishment at this decision, and pointing out that the agreement with the three railway unions, of which the consultative procedure is a part, could be terminated only by the three unions jointly giving twelve months' previous notice in writing.

Decision on Pay Claim Endorsed

Delegates at the T.S.S.A. conference at Hastings earlier this week endorsed the decision of the executive, after a joint meeting with two other railway unions, that the time was inopportune to submit a substantial wage claim in view of the independent inquiry now taking place into British Railways wages and salaries.

T.S.S.A. Annual Conference

In his Presidential address at the T.S.S.A. conference which began on May 25, Mr. R. J. Gunter said that in a modern industrial country transport should be treated as a single industry. It was madness to believe that a railway industry, a road haulage industry, and a road passenger industry could exist in their separate compartments, indifferent to the operation of each other. Transport efficiency would come only when what he called "stupid, inefficient competition," which ignored the welfare of the national economy, was removed.

In 1953, he added, the Conservative Government abolished the principle of integration of transport. Its "passion for nineteenth-century doctrine" had brought them to a state where the total financial disintegration of British Railways had been spoken of in the Press.

There were far too many vehicles on the roads, Mr. Gunter continued. "It is the economics of Bedlam to have thousands and thousands of vehicles carrying on forward journeys and returning empty." There were thousands of vehicles, more particularly of 2½ tons and over, which were operating uneconomically and should be integrated into a system.

Later in the day a resolution was passed to the effect that some sections of the trade union movement were bringing the whole movement into disrepute by using unconstitutional methods in the conduct of negotiations. The resolution asked the T.U.C. to intervene in such cases.

ILKESTON TOWN GOODS DEPOT TO CLOSE.—Ilkeston Town Goods Depot, British Railways, London Midland Region, is to be closed from June 15. Freight traffic, except for the private sidings at Ilkeston Town, and livestock will be dealt with at Ilkeston North and coal class traffic as consigned by senders.

BADNALL WHARF AND NORTON BRIDGE GOODS DEPOTS TO CLOSE.—British Railway's London Midland Region, has announced that Badnall Wharf and Norton Bridge Goods Depots are to be closed from June 22. Badnall Wharf (for Eccleshall), is between Stafford and Crewe. Freight traffic will be dealt with at Stanton Bridge or Stone and coal class traffic as consigned by senders. Norton Bridge (for Eccleshall) is between Stone and Norton Bridge. Freight traffic will be dealt with at Stone, and livestock at Norton Bridge until March 31, 1960, and thereafter at Stone.

Contracts and Tenders

Electric locomotives for the U.S.S.R. Railways

An order for 50 50-cycle single-phase C-C electric locomotives has recently been placed by the U.S.S.R. Railways with the French group, MTE and Alsthom. The order was for 10 high-speed locomotives with a maximum speed of 100 m.p.h., 30 goods traffic locomotives of 62 m.p.h. maximum, and 10 goods traffic locomotives of the same type equipped with ignitron regenerative braking.

The British Transport Commission has placed an order for electric supervisory control equipment, used for remotely controlling and supervising power supplies, needed for the following British Railways' electrification programmes on the 50 cycle a.c. system, in the Eastern Region: Liverpool Street to Enfield, Chingford, Hertford East and Bishop's Stortford; Fenchurch Street to Tilbury, and Southend; and Liverpool Street to Chelmsford, and Southend. (Conversion of the existing direct current system to alternating current in readiness for the extension of electrification by stages to East Anglia). The contract for the supply, delivery and erection of the supervisory control equipment has been placed with Standard Telephones & Cables Limited.

British Railways, North Eastern Region, has placed a contract for the installation of electric lighting in York Dringhouses Yard and adjacent buildings with F. Shepherd & Son York. Raines (H. & V.) Limited, Wakefield, has been given a contract for the removal of existing heating equipment and the installation of a new heating system in the offices at Leeds City Station.

The Special Register Information Service, Export Services Branch, Board of Trade, has received calls for tenders as follow:—

From Australia:

6 steel second class passenger sleeping cars, 4-ft. 8½in. gauge.

The Issuing Authority and address to which bids should be sent is the Secretary, Commonwealth Railways, 623, Collins Street, Melbourne. The closing date is July 7, 1959. Tender documents, specifications and drawings are available at the Office of the High Commissioner for Australia, Australia House, Strand, London, W.C.2. The Board of Trade reference is ESB/11806/59.

From Formosa:

1,008 rough rolled steel wheel tyres of various types, TRA-drg. No. A 34B, JES metal 3601-TY80 or specification AAR-M106-48 class B.

The Issuing Authority and address to which bids should be sent, is the Central Trust of China, Purchasing Department, 68, Yen Ping Nan Lu, Taipei, Taiwan. The tender No. is GFB-5286. The closing date is June 3, 1959. Local representation is essential. The Board of Trade reference is ESB/12355/59.

From Jordan:

3 underground mine locomotives, diesel driven, weight 5 ton, wheelbase 1 m., gauge 600 mm.

The Issuing Authority is the Jordan Phosphate Mines Co. Ltd., P.O. box 30, Ammon. The closing date is June 7, 1959. All offers should be c.i.f. Aqaba. The Board of Trade reference is ESB/12499/59.

Further details regarding the above tenders, together with photo-copies of tender documents, can be obtained from the Branch (Lacon House, Theobald's Road, W.C.1).

IMPORT OF MOTORCARS ON TWO-TIER WAGONS BY TRAIN FERRY.—After tests with several methods of moving motorcars from the Fiat works at Turin to the Fiat (England) works at Water Road, Wembley, it has now been decided to use M.A.T. Transport Limited two-tier car wagons which are despatched from the Turin works to Acton Main Line Goods Station, British Railways, Western Region, via the Dunkirk-Dover train ferry. The only road journey is from the goods depot to the works.

Two-tier wagons of motorcars consigned from the Fiat works at Turin to Acton Main Line Goods Station via the Dunkirk-Dover train ferry

Notes and News

Civil Engineering work at Reading.—Because of work being carried out on the track at Reading until June 7, British Railways, Western Region trains serving and passing through that station are subject to delay. For the duration of the work, three business trains, the 8.8, 8.15 and 8.25 a.m. from Reading General to Paddington have been re-timed to depart some minutes later.

Electric Train Struck by Lightning.—An electric multiple-unit train travelling from Southend to Liverpool Street, British Railways, Eastern Region, was struck by lightning during a thunderstorm which swept over London and South-East England early last Friday. The train, the 1.14 a.m. from Southend, had reached Chadwell Heath when lightning damaged the power switches. The train, which had no external damage, was pushed into the sheds at Ilford for examination.

Institute of Transport Examinations.—After submission of a review of the Institute of Transport examinations scheme by its Examinations Committee, the Council of the Institute has approved in principle proposals for the future revision of the scheme which include the extension of the Associate Membership examination by the addition of papers on the history and development of transport and the principles of management applied to transport. Ample warning of any changes will be given before they come into force.

North Eastern Region Excursion for Photographers.—This year the North Eastern Region of British Railways is to run day excursions on two occasions, to places of scenic beauty, for the benefit of photographers, their families, and friends. In connection with each of the excursions a photographic competition has been organised and the local Photographic Dealers' Associations are co-operating. Prizes will be awarded for the best photographs of scenery, family groups, and so on. One excursion, on June 7, 1959, will leave Leeds City at 9.30 a.m., calling at Bradford Forster Square, Shipley, Bingley, and Keighley and travel to Penrith. Motor coaches will meet the train at Penrith and convey the passengers to Keswick. A second excursion, on September 13, 1959, will leave Bradford Forster Square at about 9.30 a.m., calling at Shipley (connections from Keighley and Bingley), and Leeds City, and will travel through the Vale of York to Malton. The train then proceeds over the moors to Goathland and Whitby. The trains will be run at reduced speed over selected sections of the line to enable photographs to be taken from the train.

Derailment on the Southern Region, Kent Coast Line.—One coach of the 5.30 p.m. train from St. Mary Cray to Gillingham, British Railways, Southern Region, was derailed at Rochester on May 20. No one was injured. On investigation the damage was found to be greater than at first thought, and the line was not cleared until the following afternoon.

Railway Benevolent Institution.—At a meeting on May 25 the board of the Railway Benevolent Institution granted annuities to six widows and three members involving an additional liability of £197 10s. per annum; 122 gratuities were also granted amounting to £1,232 10s. to meet cases of immediate necessity. Grants made from the Casualty Fund during the month of April, amounted to £1,505 14s.

South African High Commissioner Visits Metropolitan - Cammell Carriage & Wagon Co. Ltd.—Dr. A. J. R. van Rhijn, High Commissioner for South Africa, paid a private visit to the Saltley and Midland Works of Metropolitan-Cammell Carriage & Wagon Co. Ltd. on May 20, and in the course of his visit, accompanied by Mr. W. H. Maass, Advisory Engineer, South African Railways, inspected the last of the 349 electric suburban coaches for the Reef services of the South African Railways. Regular deliveries have been effected against this contract, which was completed on time.

Central Argentine Railway Limited.—A general meeting of Central Argentine Railway Limited, which is in voluntary liquidation, will be held at Winchester House, Old Broad Street, London, E.C.2 on June 10. An account will be laid before the meeting showing the manner in which the winding-up has been conducted during the year ended April 1, 1959, and any explanations that may be given by the liquidator will be heard. The remuneration of the liquidator for the period covered by the account will also be fixed. During the major part of the year, Argentina was passing through a series of difficulties and the liquidators of the Catalinas Company were, until recently, held up in their efforts to dispose of that company's properties. Their representatives in Argentina are now engaged in discussions with the municipal authorities, which they are hopeful may result in a sale of the property.

Herbert Terry & Sons Ltd. Results.—The net profit of Herbert Terry & Sons Ltd. in 1958 amounted to £109,772 against £121,718 in 1957. The dividend has been retained at 17½ per cent. Capital expenditure during the year totalled £170,000.

Winnipeg Underground Railway Plan.—Recommendations for work to start on the construction of an underground railway system in Winnipeg, Canada, within five years have been accepted in principle by the Greater Winnipeg Transit Commission. The estimated cost of the project is $449,000,000. It calls for three cross-town routes totalling 23.15 miles of track at $11,500,000 a mile. Equipment, trains, workshops, signalling, and other requirements would cost about $184,000,000.

Stone-Platt Industries Limited Dividend.—The final ordinary dividend of Stone-Platt Industries Limited is 6 per cent making 10 per cent for 1958 on the capital as increased by an issue against an acquisition (against 15 per cent on smaller capital). In addition a special interim of 5 per cent is being paid for 1959 which will not be taken into account when consideration is given to payments of ordinary dividends for that year. Group net profits were £1,297,825, after tax of £1,375,914. The amount of group profits attributable to the parent company was £1,276,433. For 1957 group profits before acquisition of J. Stone (Holdings) Limited were £994,012, after tax of £1,035,922. Profits attributable to the parent company were £929,142.

Dover-Ramsgate Line Block by Derailed Goods Train.—The main line between Dover and Ramsgate, British Railways, Southern Region, was blocked on May 24 for most of the day at Walmer after part of a goods train ran down a gradient and was derailed. Five bogie bolster wagons loaded with some 300 tons of 300 ft. rails, two wagons, and a guard's van on the up line at Martin Mill became separated from the locomotive and ran backwards on a 1 in 70 gradient for about two miles. As they ran through Walmer Station at some 70 m.p.h., they were diverted on to a goods siding by a porter-signalman. About 200 yd. farther on they crashed through the buffer stops and mounted a high bank before overturning on to the permanent way. The guard who was shunting the train at the time tried to apply handbrakes as the wagons started to move. He received slight leg injuries. Throughout the day, London trains to Dover via Ramsgate were terminated at Walmer and the Ramsgate up trains on the coast route turned at Deal. Buses took passengers between Deal and Walmer. Both lines were cleared soon after 4 p.m.

New I.C.T. Film.—International Computers & Tabulators Ltd., has produced a new colour film entitled "Time to Think." The film concentrates on presenting the economic case for the digital computer at the expense of the usual "how it works" angle. The point of view is that of the prospective user. Answers are given to the questions, "How do we find out whether a computer can be of use to us?" "Which computer will best meet our requirements?" and "How do we set about preparing for its installation?" Differing attitudes and prejudices for and against installation are expressed by representatives of production, sales, finance, and other departments of top management. The approach of the spokesmen for the computer company is undogmatic and

New Works at Hull Docks

View from passenger building of new works on Riverside Quay (left) and South Side, Albert Dock (right), Hull, opened by the Princess Royal on May 12 and briefly mentioned on page 606 of our May 22 issue

extravagant sales talk is avoided. A "feasibility team" is appointed by the still-uncommitted potential user-company from its own staff and emphasis is laid on the care with which this team looks into the company's existing organisation and methods. The film was made by Cinechrome Limited, was produced by Edwin W. Cotton, and directed by Jack Flack. Running time is 40 min. It is available on free loan from the Films & Lectures Department, I.C.T., Gloucester House, 149, Park Lane, London. W.1, telephone, HYDe Park 8080.

Purchase of Australian Equipment for Indian Railways.—A delegation from the Indian Railways Board is in Australia investigating prospects of obtaining a wide range of railway equipment from Australia. Members are guests of the Federal Government. The mission is reported to be planning the purchase of a large number of diesel-electric locomotives.

Western Region Publicity.—One of the new season's posters produced by the Public Relations & Publicity Department of the Western Region of British Railways publicises British Railways only narrow-gauge passenger train service, through the Rheidol Valley from Aberystwyth to Devils Bridge. It has been printed in three colours by Jordison & Co. Ltd., and 1,200 copies will be displayed during 1959.

Blaw Knox Limited 1958 Orders Decline.—A total dividend of 30 per cent, for 1958, approved at the annual general meeting of Blaw Knox Limited, was possible despite the volume of orders being well below the capacity of factories, which lead to under-recovery of overheads. The Transmission Tower Division handled a satisfactory volume of business and contributed substantially to the company's earnings.

Butterley Co. Ltd. Deficit.—A net loss of £549,390 was incurred by the Butterley Co. Ltd. in 1958, compared with a profit of £14,331 in the previous year. No further distribution out of capital profits is recommended, but the position will be reviewed in October. A capital distribution of 13¾ per cent tax free was paid last December in lieu of the interim dividend. For 1957 capital distributions totalling 40 per cent were paid.

Forestal Land, Timber & Railways Co. Ltd. Results.—The final ordinary dividend of Forestal Land, Timber & Railways Co. Ltd., is held at 6 per cent, making an unchanged total of 9 per cent. Group trading profits for 1958, excluding the results of the Argentine group, were £732,651 (against £1,074,551), after depreciation of £244,359 (£202,050). To the profits were added remittances of dividends from La Forestal Argentina S.A. declared in 1958 of £68,547 (£55,211 for 1957 and £215,341 declared in previous years). Group net profits were £592,052 (£770,440), after tax of £209,146 (£574,663). The subsidiaries retained £595,436 (£704,803). To general reserve is placed £370,000 (£275,000).

British Railways Type "2" Deltic Locomotives in Service.—The Type "2" Deltic Bo-Bo 1,100-h.p. diesel-electric locomotives are now being placed in service in the Eastern Region of British Railways. They were designed and are being constructed by the English Electric Co. Ltd. Each is powered by a single Napier Deltic T9-29 turbo-charged two-stroke opposed-piston engine with three banks of cylinders in inverted delta formation. Three crankshafts are geared to a common output shaft driving the traction generator at 1,600 r.p.m. when developing maximum rated power. The weight in full working order is 73 tons 17 cwt., and the maximum tractive effort 47,000 lb. Ten of these locomotives will be used on the Great Northern Line outer and inner suburban services from Kings Cross, Moorgate, and Broad Street.

British Iron & Steel Research Association.—The annual report for 1958 of the British Iron & Steel Research Association includes a section on mechanical handling plant in which are details of the work done on behalf of the British Iron & Steel Federation's Committee on Vacuum Brakes. It is reported that a rig representing the adjacent ends of two wagons was used to demonstrate the effect of variations in the position of the hook, length of buffers, track curvature, and ground-level on the problem of using shunting - poles to couple screw couplings. Several devices to make it easier to handle heavy Continental screw couplings with a shunting-pole were tested. Although some success was achieved, no methods were found that were free from objection on other grounds.

Production of Vacuum Brake Cylinders by G. D. Peters Limited.—Mr. Alexander Dowie, the Chairman of G. D. Peters Limited, stated earlier this week that the company had been given authority to continue the production of vacuum brake cylinders at a trickle until such time as the British Transport Commission made a decision about the continuity of the wagon braking programme. This production was, he said far below the group's capacity and, while it enabled the retention of a nucleus of skilled and experienced productive employees, it provided little contribution to the profits in comparison to that which should have accrued from this source. Production of vacuum brakes in 1957 and 1958 represented nearly half the company's output, and it was impracticable to anticipate making good the shortfall of production from other products and a serious diminution of profit in 1959 must be anticipated. Bearing in mind this fact, the organisation was doing its utmost to build up the turnover of other products.

Second New Cargo Vessel for Channel Islands Service.—On May 25 Mrs. Valentine, wife of Mr. A. B. B. Valentine, a Member of the British Transport Commission and of the Southern Area Board and recently appointed Chairman of the London Transport Executive, launched the second of the two twin-screw cargo vessels, which Brooke Marine Limited is constructing in its Lowestoft shipyard, for the British Railways, Southern Region. Designed in conjunction with the B.T.C. consultants, Messrs. Burness, Corlett & Partners, mv. *Moose* is 288 ft. long overall, with moulded breadth 32 ft. Tonnage is approximately 1,000 gross and designed speed 14 knots. The vessel will be propelled by two 900 b.h.p. Sulzer diesel engines placed aft, which were reassembled at the Brooke Marine yard. Specially designed for rapid cargo handling in bulk or by pallets the ship can carry a considerable number of containers, and has facilities for the carriage of cattle. The crew have two-berth cabins and the officers single cabins. The vessel will be equipped with echo-sounding apparatus, radar, radio telephones, and V.H.F. It is intended that both the *Moose* and the sister ship, *Elk*, will replace the *Haslemere*, *Ringwood*, and *Whitstable*, on the Channel Islands Service.

Cummins Engine Co. Ltd. Mobile Diesel Centre.—The Cummins Engine Co. Ltd., in association with its sole U.K. distributors, Cummins Diesel Sales & Service Limited, Hunsbury Works, Northampton, has on tour a mobile diesel centre, from which instructional lectures are given to Cummins engine users throughout this country. The comprehensive range of components shown at the diesel centre facilitate practical demonstrations in assembly, adjustment, and most aspects of diesel maintenance. The illustration shows the mobile lecture room raised clear of the partly withdrawn chassis by built-in hydraulic jacks. About two hours are required to open up the sides and prepare for a demonstration or lecture to begin.

Powell Duffryn Limited Dividend.—The board of Powell Duffryn Limited, has announced a dividend of 2⅜ per cent actual, less tax, on the 3,600,000 4¾ per cent cumulative preference shares of 10s. each for the six months ending June 30, 1959.

Anhydrite Consignments by Rail from Cumberland.—The one-millionth ton of anhydrite to be sent from Long Meg Mine, near Penrith, Cumberland, to a sulphuric acid plant at Widnes was despatched by British Railways, London Midland Region, on May 20. The 1,000,000 tons have been moved in 42,500 wagonloads. At a brief ceremony to mark the occasion, Mr. D. Storey, Director & General Manager of the mine, asked Mr. Kerr-Muir, Chairman of the United Sulphuric Acid Corporation Limited to press the button which released the 1,000,000th tow into a wagon below the hoppers at the mine. The wagon carried posters indicating its contents, and the locomotive which eventually took the train of

Cummins Engine Co. Ltd. mobile diesel centre, which contains a lecture platform with engine sub-assembly demonstration fixtures. Note built-in hydraulic jacks

anhydrite from the mine to Carlisle en route to Widnes bore a special headboard. Others present included Mr. D. Shackley, Director of the Long Meg Plaster & Mineral Co. Ltd.; Mr. W. E. Grainger, Acting Divisional Traffic Manager, British Railways, L. & M. Region, Barrow-in-Furness; and Mr. J. A. K. Gray, District Traffic Superintendent, Carlisle. The Long Meg Mine has been developed over the past six or seven years since foreign trade restrictions on the import of sulphur into Britain in the 1950's. The anhydrite is used for manufacturing acid and cement.

Great Bridgeford Station to Close.—Great Bridgeford Station, between Stafford and Crewe, in the London Midland Region of British Railways, is to be closed for all traffic from June 22. Parcels and passenger train merchandise, goods traffic and livestock will be dealt with at Stafford and coal class traffic as consigned by senders.

Morgan Crucible Co. Ltd. at Careers Exhibition.—At the National Education and Careers Exhibition at Olympia, London, opened on May 26 and continuing until June 5, the Morgan Crucible Co. Ltd. display is intended to give an idea of the way in which Morgan products affect the everyday life of the public. Also it invites attention to the field of opportunity in careers existing within the Morgan organisation.

Timber Development Association Report.—Statistics included in the 1958 report by the Timber Development Association show that design assistance was given to 8,936 applicants and that special designs were submitted for 133 projects. Also the Association sponsored 60 educational courses attended by 1,657 students, and continued or instituted research on 43 projects. The conoid-shell roof of British Railways Oxford Road Station, Manchester, and the barrel-vault roof of Coventry Parcels Depot, British Railways, London Midland Region, are given as examples of the use of timber in public building work. During 1958 a total of 22,671 standard designs for construction in wood were issued and 40 new and revised standard designs were prepared.

" C "-Licence Threat to Public Transport.—Sir Brian Robertson, Chairman of the British Transport Commission, stated earlier this week in an address to the London branch of the National Union of Manufacturers that if the growth in " C "-licence vehicles continued at the present rate it would, in the end, virtually eliminate public transport, public road transport first. Among the producers of consumer goods the railways had " virtually lost the business which goes in wagonload quantities." Those responsible for the consumer goods industries had become very road-minded. The railways, he declared, were giving a demonstrably better service than for a long time. Transit times were better, a great deal of attention had been given to the speed and care of terminal handling, and selling traffic was no longer just the responsibility of a " subordinate townsman."

Forthcoming Meetings

June 4 (*Thu.*).—Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. " Notes on the construction of railway models," a talk by Mr. R. S. Garlick.

June 5 (*Fri.*).—The Railway Club, at the Royal Scottish Corporation, Fetter Lane, London, E.C.4, at 7 p.m. Paper on " The History of the Railway Club," by Mr. B. D. J. Walsh.

June 6 (*Sat.*) to June 11 (*Thu.*).—Permanent Way Institution. 75th Anniversary Convention in London.

June 16 (*Tue.*) to June 25 (*Thu.*).—Institute of Transport. Continental visit to Denmark.

June 17 (*Wed.*).—Institution of Civil Engineers, at Great George Street, Westminster, S.W.1. Conversazione.

June 20 (*Sat.*).—Permanent Way Institution, Leeds & Bradford Section. Visit to B.T.C. Engineering Research Laboratories, Derby.

June 25 (*Thur.*).—The Model Railway Club, at Caxton Hall, Westminster, S.W.1, at 7.45 p.m. Paper on " The Tralee & Dingle Railway," by Mr. P. B. Whitehouse.

June 26 (*Fri.*).—Permanent Way Institution, East Anglia Section. Visit to Taylor Bros. (Sandiacre) Ltd., Nottingham.

June 27 (*Sat.*).—Permanent Way Institution, London Section. Visit to Meldon Quarry, near Okehampton, Southern Region.

Railway Stock Market

Active and buoyant conditions again ruled in stock markets with the emphasis still on industrial shares which maintained their upward trend, though profit-taking was more in evidence after recent big gains. A number of higher dividend announcements stimulated equity shares, but in contrast, British Funds were easier again. Foreign rails attracted little attention, which were generally around the same levels as a week ago.

Costa Rica ordinary stock was 13½ and the 6½ per cent first debentures 75½. Chilean Northern first debentures were 58½, Brazil Railway bonds 5½ and Guayaquil & Quito assented bonds 82½. Elsewhere, International of Central America common and preferred stocks were $23¼ and $108 respectively.

United of Havana second income stock remained at 6 and the consolidated stock changed hands around 1. San Paula Railway 3s. units were 1s. 7½d., while in other directions, Mexican Central " A " bearer debentures were 58½.

Canadian Pacifics were $53⅜ at which there is a yield nearly 5¼ per cent, which is attractive compared with the yields on many other dollar stocks. Canadian Pacific 4 per cent preference stock at 53⅝ yield over 7 per cent, which is generous; there is no doubt this stock would stand considerably higher if the dividend were not non-cumulative, though it is well covered and the fact that the dividend is non-cumulative is in reality merely an academic factor unless there were a very heavy fall in earnings. Canadian Pacific 4 per cent debentures have changed hands around 63⅜ xd. White Pass shares were $15.

Nyasaland Railways shares kept around 13s. 9d. following the results and maintained 6 per cent dividend; the 3½ per cent debentures were 60½. West of India Portuguese capital stock was quoted at 106 and the 5 per cent debentures at 91½. Barsi ordinary stock again had a quotation of 24.

Beyer Peacock have been firmer at the higher price of 7s. 8½d., at which there is a yield of over 7½ per cent on the basis of the 12 per cent dividend. Charles Roberts, 5s. shares were firm at 12s. 9d. and in other directions, Westinghouse Brake were 43s. 6d. yielding little more than 4½ per cent, but the moderate yield is a reflection of higher dividend hopes and also of the strong balance-sheet position. Birmingham Wagon were 20s. 7½d. and yield over 9⅝ per cent on the basis of last year's 10 per cent dividend. Elsewhere, North British Locomotive improved further to 11s. 3d. Wagon Repairs 5s. shares were 9s. 9d. and Gloucester Wagon 10s. shares 18s. 10½d.

G. D. Peters were again quoted at 25s. Pressed Steel 5s. shares have risen afresh to the new peak of 28s. 9d. while Dowty Group 10s. shares strengthened to 41s. 3d. A.C.V. have firmed up to 47s. 6d. xd and Leyland Motors were 54s. British Timken were quoted at 82s. 9d. and Pollard Bearing 4s. shares at 24s.

Ransomes & Marles 5s. shares changed hands around 18s. 9d. while Newton Chambers moved up to 69s., a new peak for the year. Carrier Engineering 5s. shares were higher at 56s. 6d. and Crofts Engineering 5s. shares 15s. 7½d. George Cohen 5s. shares were 12s. and Renold Chain 47s. 9d. T. W. Ward reached a new high for the year of 91s. 9d., but Birmid Industries eased to 77s. 10½d., Head Wrightson 5s. shares at 28s. remained under the influence of the good impression created by the results. The raising of the dividend from 17½ per cent to 20 per cent represents a conservative distribution of profits; earnings on the shares show a fourfold cover for the higher dividend.

OFFICIAL NOTICES

BRITISH RAILWAYS have a vacancy for a CHIEF PROGRAMMER for an Elliot 405 Computer Installation at Wolverton, Bucks.

Candidates, preferably under 35, must have had previous Elliot 405 Computer Programming experience; qualifications to degree standard are desirable.

Commencing salary £1,000/£1,100 with prospects of advancement. Contributory pension fund, sick pay and travelling facilities.

Applications to Regional Accountant, London Midland Region, British Railways, Euston Station, London, N.W.1.

BRITISH TRANSPORT COMMISSION requires in the Department of the Chief Electrical Engineer at 14 Melbury Terrace, Marylebone, London, N.W.1:

Post (1) *Principal Scientific Officer—salary range* £1,535-£1,815. Engineer or Physicist with good degree and considerable experience in the organisation and execution of research projects. Interest in one or more of the following: physics of the solid state, properties of metal surfaces, electrical contact phenomena or friction and wear. Initially will be required to work on problem of controlling adhesion between wheel and rail; later opportunities for original work within the broad field embraced by electric traction.

Senior Scientific Officers—salary according to qualifications and experience subject to a maximum of £1,315. Good degree and post graduate research experience. Industrial training an advantage. Initially may be required to spend two to three years on research in Universities or industrial firms:

Post (2) Interest in surface phenomena in electrical engineering and will be required initially to co-operate in an investigation of commutation and current collection.

Post (3) Application of modern techniques such as semi-conductors or magnetic amplifiers to electric traction problems. Thorough grounding in electromagnetic theory required.

Post (4) Thermal problems associated with electric equipment. Good knowledge of theory of heat transfer and expertise in all forms of temperature measurement essential.

Technical Assistants—salary range £833-£903

Post (5) Engineer or Physicist preferably possessing degree or equivalent qualification with some experience in application of modern instrumentation with special emphasis on electronic methods.

Posts (6) *and* (7) Engineers qualified for A.M.I.E.E. or A.M.I.M.E. and having experience of conduct of experiments.

Post (8) *Technical Assistant—salary range* £943-£985. Engineer with degree or equivalent qualification, experienced in application of modern instrumentation with special emphasis on electronic methods.

Superannuation scheme. Certain free travel facilities. Medical examination. Write, quoting post number and stating age, qualifications and experience to Director of Establishment, British Transport Commission, 222, Marylebone Road, N.W.1, within 14 days. S.A.E. for acknowledgement.

RAILWAY TURNTABLE. For sale, Mundt type standard gauge turntable, 65 ft. long, carrying capacity 150 tons approx. WATER CRANE, 3,000 gallon Water Crane. TURNOUTS. Twenty 1 in 8 Turnouts in 75 lb. F.B. rail; interchangeable to suit L.H. or R.H. All these items are in excellent condition Apply Eagre Construction Co. Ltd., East Common Lane, Scunthorpe, Lincs. 'Phone: 4513.